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REFERENCES AND ABBREVIATIONS

Readers in search of a given subject will find it useful to bear in mind that the references are in several cases distributed under two or more separate but nearly synonymous headings. Institutions and Corporations with the right to the prefix Royal will be found under that prefix, with the exception of Hospitals, which will be found under that heading; and Medical Societies, which are separately indexed under Societies. All Universities are indexed under the word University. (A.) = Annotation, (C.) = Correspondence, (N.I.) = New Inventions, (L.A.) = Leading Article, (M.L.) = Medico-legal, (M.T.T.) = Modern Technique in Treatment, (O.) = Obituary, (P.I.) = Parliamentary Intelligence, (R.) = Review, (R. and A.) = Reports and Analyses, (N.P.) = New Preparations, and P. and C.P. = Panel and Contract Practice.

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ADDRESSES AND ORIGINAL ARTICLES

TOXIC JAUNDICE.*

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(WITH COLOURED PLATE.)

LECTURE I.

DURING the late war the frequent occurrence of toxic jaundice amongst munition workers and those engaged in the manufacture of aeroplanes offered numerous opportunities for close study of the causes and clinical and pathological manifestations of this disease. In the various campaigns all over the world in which our troops played an important part epidemics of toxic jaundice were common. These outbreaks showed that "toxic jaundice" was not limited in its ætiology to chemical poisons, but that toxins of biological origin were even more fertile in its causation.

Since 1919 great advances have been made in our knowledge of the pathology of jaundice, of which perhaps the most important have been the brilliant researches of Hijmans van den Bergh, which have added much to accuracy and precision in diagnosis. The valuable and thoughtful studies of Dr. W. J. McNee have done much to elucidate our knowledge of the causation. The 1929 edition of "Diseases of the Liver and Gall-bladder and Bile-ducts," by Sir Humphry Rolleston and Dr. McNee, has also been of great value in the review and criticism of the recent work on jaundice of toxic origin.

A special reason for my selection of this subject is the frequent occurrence, during the last few years, of delayed, dangerous, and sometimes fatal cases of toxic jaundice due to the administration of recently discovered drugs. One of the most important group of drugs, from this point of view, is the quinophan group, which includes preparations known by the names of Atophan, Cincophen, Phenoquin, Agotan, Atophanyl, and Atoquinol, all of them derivatives of quinoline.

DEFINITION OF JAUNDICE.

Osler gives the following brief but excellent definition in his Text-book of Medicine: "Jaundice or icterus is a condition characterised by coloration of the skin, mucous membrane, and fluids of the body by the bile-pigments." It must be remembered that jaundice is a symptom of some underlying condition which causes an accumulation of bile-pigment (bilirubin) in the blood beyond the normal limits.

This accumulation may be caused, as in "obstructive jaundice," by mechanical obstruction of the common bile-duct or common hepatic duct whereby the bile-pigments are reabsorbed into the blood and lymphatic circulation. In toxic jaundice some toxic factor impairs the excretory power of the liver cells for removing bile from the blood, and often at the same time causes an excessive destruction of red blood corpuscles, with a consequent increased production of bile-pigments. Thus, in attempting to classify the various forms of jaundice, consideration must be given not only to the presence of bile-pigment in the blood in increased amount, but also to the clinical symptoms caused by the underlying condition responsible for the jaundice.

Recent biochemical researches have enabled us to make accurate estimations of the bilirubin in the blood. According to van den Bergh[1,2] normal human serum contains from 1 in 1,000,000 to 1 in 400,000 parts of bilirubin. He gives as 1 unit an amount of 1 in 200,000, so that the normal bilirubin content of the serum would be ½ unit. He showed that there were many conditions in which the bilirubin content might rise to figures from ½ up to 4 or 5 units without clinically definite jaundice of the skin and mucous membranes. This state of the blood has been described as "latent jaundice," and some common examples are pernicious anæmia, chronic hepatic disease such as cirrhosis, and the blood state following the administration of certain drugs, such as arsenobenzol derivatives, which have a known toxic action on the liver and which have not yet produced manifest jaundice.

The bilirubin content of the blood has been also estimated by a method published by Meulengracht in 1921.[3] In this the colour of the serum is matched against a solution of bichromate of potash. A tint corresponding to a solution of 1 in 10,000 is fixed as 1 unit. The colour of the blood-serum is given as so many units according to this scale, and is termed the "icterus index." Normal blood-serum, according to this method, would have a value of 1 to 5 units. In latent jaundice the figure would be from 6 to 15 units. An icterus index of over 15 units would occur when clinically definite jaundice was observable.

False jaundice may occur from the coloration of the skin by dyes of various kinds, such as saffron, turmeric, and trinitrotoluene. It may also occur from taking by the mouth picric acid or other absorbable yellow dyes which stain the tissues. The application of van den Bergh's bilirubin test to the blood-serum would at once differentiate these spurious forms from true jaundice.

CLASSIFICATION OF JAUNDICE.

The simplest and most satisfactory classification is that adopted by Rolleston and McNee—viz.: (1) obstructive hepatic jaundice; (2) toxic and infective hepatic jaundice; (3) hæmolytic jaundice. No classification can be perfect, since the different varieties of jaundice are often combined. Thus in toxic jaundice there is frequently an obstruction to the smaller bile-ducts in the liver as part of the hepatitis set up by the toxic agent. Then, again, hæmolytic jaundice may be combined with toxic jaundice when the toxic agent, such as arseniuretted hydrogen or the toxin of yellow fever, has a destructive action on both the blood and liver cells. It is proposed to include under the term "toxic jaundice" jaundice due to the action of exogenous chemical poisons, or to toxins of extraneous or autogenous biological origin. This will include all of group (2) in the above classification and some types of group (3). It will, of course, include the toxæmias of pregnancy and acidosis, which are associated with jaundice.

In a recent paper Dr. Arnold Rice Rich suggests that the classification of jaundice given above is unsatisfactory, and divides jaundice into two groups:

1. *Retention jaundice*, where an indirect van den Bergh reaction is given. The urine contains no bilirubin or

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* The Lumleian Lectures delivered before the Royal College of Physicians of London on March 19th, 24th, and 26th, 1931.

bile-salts but increased urobilin, while the stools have increased urobilin. This group includes the various forms of hæmolytic jaundice and jaundice resulting from anoxæmia.

2. *Regurgitation jaundice*, where a positive van den Bergh reaction is given. The urine contains bile-pigment and bile-salts and the stools decreased urobilin. This group includes the various forms of jaundice associated with necrosis of the liver cells—i.e., toxic jaundice of chemical or biological origin as included by me in these lectures, and also the various forms of obstructive jaundice due to mechanical obstruction of the main bile-ducts.

In my opinion the suggested new classification is unsatisfactory because it does not attach sufficient importance to and differentiation of the clinical symptoms of the general underlying cause of the jaundice. Thus the jaundice due to phosphorus poisoning is so essentially different clinically from the jaundice following simple stricture of the common bile-duct that to group these two conditions under the same heading is very undesirable. Then, again, while the jaundice of necrosis of the liver cells may be obstructive in type for a few days and give the laboratory findings of regurgitation jaundice, clinical observation shows that in non-fatal cases these laboratory findings do not persist but quickly change into those partly resembling the so-called retention jaundice.

Another reason which makes this classification unacceptable is that it is based on the variations of the van den Bergh reaction. The present state of our knowledge of this reaction does not admit of a classification of jaundice based on the varieties exhibited by it. Thus, in a discussion on jaundice at the British Medical Association annual meeting in 1924 [6] Dr. van den Bergh was the first to admit that the causation of the variations of his reaction, such as the biphasic and delayed and the indirect type, were not fully understood. Most observers in this country have found that in cases of deep jaundice the van den Bergh reaction is not of much help in the differentiation of the type, since in such cases a marked biphasic reaction is usually given.

Liver Functions in Relation to Toxic Jaundice.

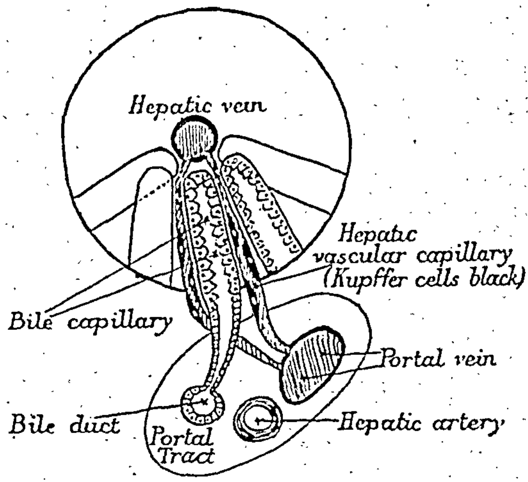
The liver plays a most important part in the body metabolism, and impairment of its metabolic functions quickly leads to toxic symptoms which are commonly accompanied by more or less deep jaundice. The liver cell is the dominant factor in the regulation of the complicated biochemical processes going on in the body. So complex are these processes, and so little understood, that the part played by the liver is probably much more profound than is at present realised. We know that complete suspension of the liver function means speedy dissolution and death in a very few days from auto-intoxication.

BILE.

The theory of bile-pigment production and bile secretion put forward by Dr. McNee in his critical review of jaundice in 1923 is now generally accepted.[7] The diagram from that paper, which is published by his kind permission, illustrates the essential points (Fig. 1). The bile-pigments are produced from hæmoglobin by the destruction of red blood corpuscles in the phagocytic cells of the recticulo-endothelial system, these cells being known as Kupffer cells. It is known that this destruction of red blood corpuscles takes place in the Kupffer cells in the liver, spleen, and bone-marrow. It is in these cells that bilirubin is produced. The bilirubin circulates in the hepatic capillaries, and passes from them into the bile capillaries lying in the centre of the liver tubules. If the liver cells are healthy the bilirubin passes through them and becomes combined in some loose way with bile-salts and cholestrin. This association of the bilirubin prevents its adsorption by the proteins of the plasma, and bilirubin in this state will give a direct van den Bergh reaction.

In some conditions—for example, in anoxæmia of the liver cells whereby their function is seriously impaired—the bilirubin from the hepatic capillaries cannot be fully absorbed by the damaged liver cells, and as a consequence it remains in the blood stream, entering into physical combination with the proteins of the plasma. In this condition the blood-serum only gives a van den Bergh reaction after treatment with alcohol, whereby the bilirubin is separated from the plasma proteins. In other words, an "indirect ven den Bergh" reaction occurs. This condition of things happens in acholuric jaundice and in various forms of hæmolytic jaundice, especially when associated with anæmia which causes anoxæmia of the liver cells.

FIG. 1.



A liver lobule (diagrammatic).

"FAT METABOLISM."

Normally a certain amount of fat is stored up in the liver cells, and this consists mainly of unsaturated fatty acids in organic combination. In conditions of toxic jaundice fatty degeneration is often a marked feature, and the liver cells become engorged with fat. This fat differs chemically from the fat deposited in the liver cells under normal physiological conditions. It is composed of saturated fatty acids in organic combination.

Very marked fatty degeneration and distension of the liver cells with fat is met with in toxic jaundice from such chemical poisons as chloroform, phosphorus, alcohol, trinitrotoluene, and tetrachlorethane; it is also seen in the toxic jaundice associated with acute or subacute hepatic necrosis or with conditions of auto-intoxication such as acidosis or the toxæmias of pregnancy. A. G. R. Foulerton published an interesting paper on this subject in 1918.[8]

"GLYCOGEN FUNCTION."

The presence of glycogen in the liver cells seems to increase their power of resistance to toxic agents. Glycosuria has sometimes been observed in toxic jaundice. Garrod [13] has recorded a case of glycosuria in catarrhal jaundice, and glycosuria has been observed in the toxic jaundice of phosphorus, chloroform, and other poisons.

As a converse to this, an interesting case was reported by J. Bordley.[9] A patient, aged 47, who had suffered for eight years from severe diabetes mellitus, at the end of this period developed hepatic cirrhosis with ascites. At this stage the blood-sugar became normal and the diabetes disappeared. Claude Bernard recorded a similar case in 1877, where a man, aged 55, lost the symptoms of diabetes mellitus at the onset of portal cirrhosis and ascites.

PROTEIN METABOLISM.

The most important function of the liver is the part its cells play in breaking down the complex products of protein metabolism, many of which have powerful toxic properties, into simple nitrogenous compounds such as urea, uric acid, creatinine, and hippuric acid, which are eliminated by the kidney. When the liver cells are so damaged by the action of chemical or biological poisons that this function is impaired, symptoms of the gravest kind may set in and death result from the rapidly developing auto-intoxication caused by the toxic effects of the complex intermediate products of protein metabolism.

TOXIPHYLACTIC FUNCTION.

A most important function of the liver is its protective function, whereby the body is protected against exogenous poisons. The term "toxiphylactic function" was suggested by me in 1922.[10]

If the poison is absorbed by the alimentary tract it is conveyed by the portal vein to the liver, which absorbs much of the poison and acts as the first line of defence. When the poisons are introduced into the general circulation as, for example, the intravenous injection of arsenobenzol derivatives, the liver absorbs much of the poison from the blood stream and so protects the other tissues of the body. In exerting its prophylactic function the liver itself often suffers severely, and its cells may undergo fatty degeneration, cloudy swelling, or even extensive necrosis. In addition, an inflammation of the interstitial tissues may be set up and a progressive hepatitis with fibrosis result. In cases of fatal poisoning, whether from mineral poisons such as arsenic and lead, or from organic poisons such as morphine and strychnine, the greater part of the poison is found in the liver and this organ is the most important for reservation for analysis. The poison found in the liver is poison which has already exerted its toxic effect on the body, whereas that found in the alimentary tract is unabsorbed and has not exerted its toxic effects on the tissues of the various body organs.

A striking example was the Maybrick case, where the deceased had lived for several days after the administration of arsenic. In this case no arsenic was found in the stomach, and a trace only in the kidneys, *while the liver contained about gr. ½.*

It is important to remember that some poisons, which are rapidly eliminated or which may undergo oxidation in the body, may irreparably damage the liver, so that it undergoes extensive necrosis and death results several days after the taking of the poison. The terminal symptoms are due to the endogenous poisons consequent on cessation of liver function, not to the continued action of the exogenous poisons originally taken. Examples of this are phosphorus, delayed chloroform poisoning, and tetra-chlorethane poisoning. In such cases no trace of the original chemical poison may be expected to be present in the body at the time of death.

Liver Function Tests.

Much work has been done in attempting to discover a satisfactory test for liver function analogous, for example, to the blood-urea test for renal function. At the present time, it must be admitted, most of the tests for hepatic function are unsatisfactory in that they fail to indicate the impending danger of that complete breakdown of hepatic function which usually *terminates fatally in a very few days.*

The *van den Bergh test* and the *icterus index* are of value in indicating the bile-regulating mechanism of the liver, but this is not the function of vital importance. High values of these tests are not necessarily indicative of complete breakdown of hepatic function. It is the function of the hepatic cells which it is so necessary to determine. The liver is very uniformly supplied with blood and the loss of function of the hepatic cells is nearly always due to the flood of toxins carried to them by the blood stream. The individual liver cells are therefore submitted to the same toxic influences; in other words, they stand or fall all together. This explains the fact that many of the tests do not show a positive indication of loss of hepatic function until too late —i.e., until a condition of acute and fatal necrosis has set in.

The *lævulose test* is, in my experience, the most valuable and sensitive test, and that which best shows early impairment of function. The healthy liver can dispose of 50 g. of lævulose taken by the mouth so that there is no rise of blood-sugar. If the cells are impaired in function a definite rise occurs.

The *phenoltetrachlorphthalein* and *bromsulphalein tests.*—One of these substances is injected intravenously in calculated amount. If hepatic function is normal practically no dye will be left in circulation after half an hour. Where the liver function is impaired, appreciable quantities of the dye remain in circulation. These tests have found much favour in America. They are well described by Dr. G. A. Harrison.[11]

The lipase test, the fibrinogen test, the nitrogen partition test, and other tests have been found to be of little or no clinical value. They are subject to other influences than variation in hepatic function, and marked results are only given when it is too late—i.e., when an extreme degree of hepatic necrosis has developed.

Morbid Anatomy and Histology.

In toxic jaundice the liver may be greatly enlarged and on section show a striking yellow appearance, due to the excessive deposition of fat in the liver cells, and pieces of such livers may float in water. This type of liver is seen in delayed chloroform poisoning, in the fatal acidosis of children, in phosphorus poisoning where death occurs early, and in some cases of alcoholism.

I was informed by the late Sir Norman Moore, who was an acknowledged authority on both medicine and literature, that the term "cirrhosis" was originally applied to livers showing a marked yellow appearance, and that etymologically this is the correct application of the term, for it is derived from the Greek word "kirros," meaning reddish yellow or tawny. Of late years the term "cirrhosis" has become restricted to livers showing fibrotic changes such as occur in the portal cirrhosis of alcoholism.

Acute and subacute necrosis of the liver is the most common condition found in fatal toxic jaundice. It is described below under "necrosis of the liver."

The following microscopical changes are seen:—

(1) *Cell degeneration.*—The liver cells commonly show extensive fatty degeneration and are distended with fat. In some cases marked cloudy swelling is observed.

(2) *Necrosis of liver cells.*—The cells may be necrosed and granular, their nuclei having disappeared, or the cells may have entirely disintegrated and disappeared.

(3) Fibrous tissue may have developed in areas formerly occupied by liver cells (replacement fibrosis).

(4) Active progressive fibrosis with round-cell infiltration may be present.

(5) Regeneration of liver cells may occur in the less severe cases. The regenerated cells do not form themselves into the architectural structure of physiological lobules but are isolated masses of liver cells.

(6) Proliferation of the cells of the bile canaliculi may occur in the less acute cases.

Illustrations and Cases.

The accompanying coloured plate reproduces drawings of microscopical sections from six recent fatal cases of toxic jaundice, and these illustrate all the important points. The cases may be briefly summarised as follows:—

CASE 1.—*Phosphorus poisoning.* (P.M. 141/29.) Male, aged 22. Admitted to St. Mary's Hospital two hours after taking rat poison (phosphorus). Continued vomiting occurred. After three days jaundice developed and deepened, the liver became enlarged, the stools were clay-coloured. Death followed six days after taking the poison. The liver was found to weigh 1850 g. The cut surface was bright yellow with several subcapsular hæmorrhages. Microscopically there were extreme fatty changes more marked at periphery of lobules where cells have lost their nuclei and are represented by large fatty globules. (See Plate, Fig. I.) Stained with hæmatoxylin and Sudan III. (× 60.)

CASE 2.—*Cirrhosis of liver following novarsenobillon injections.* (P.M. 4/29.) Male, aged 63. Ten injections of 0·6 g. novarsenobillon given in February and March, 1928, the last on March 25th. On August 1st, 1928, jaundice developed; this was followed by ascites, paracentesis abdominalis being performed nine times. Wassermann reaction negative; van den Bergh reactions biphasic. Death on Jan. 3rd, 1929. At autopsy the liver was small (900 g.) with a thickened capsule. On section it had a finely granular surface with yellow areas of regeneration nodules and intervening greyish fibrous tissue.

Microscopical examination showed a thickened capsule; large numbers of proliferating bile-ducts; round-celled infiltration and young fibrous tissue; and liver cells, some regenerating and some dying—many containing bile. (Fig. II.) Stained with hæmatoxylin and eosin. (× 60.)

CASE 3.—*Subacute necrosis, toxic jaundice.* (P.M. 228/26.) Male, aged 58. Malaise from Nov. 15th, 1926. On Nov. 22nd, 1926, nausea and vomiting, hepatic discomfort. On the 25th, jaundice set in, which rapidly deepened. On the 27th, the patient was delirious, the stools were pale, and van den Bergh's reaction was biphasic. The Wassermann reaction was negative. The urine contained albumin, granular and hyaline casts. On Dec. 2nd coma developed and death occurred on the 5th. The liver was small (950 g.), soft, and flabby with a mottled yellow and grey surface. On section it was yellow with a few red areas. The microscopical section shows dilatation of sinusoids in areas where liver cells have died and been autolysed. The remaining liver cells have undergone fatty changes and many contain bile. (Fig. III.) Stained with hæmatoxylin and eosin. (× 95.)

CASE 4.—*Alcoholic cirrhosis.* (P.M. 101/26.) Female, aged 54. History of chronic alcoholism for over ten years. Ascites. Paracentesis abdominalis twice in 1926. On June 15th, 1926, hæmatemesis; death on June 18th. The liver was small (1325 g.) and pale, with a coarsely granular hobnailed surface. Section showed coarse strands of pale fibrous tissue uniformly distributed throughout the organ. The spleen was enlarged. Microscopical examination showed regeneration nodules surrounded by fibrous and elastic tissue. Also much fat in the liver cells. (Fig. IV.) Stained with hæmatoxylin, Weigert's elastic stain, and Sudan III. (× 60.)

CASE 5.—*Eclampsia. Toxic jaundice.* (P.M. 66/28). Female, aged 41. Admitted in coma following a fit in the first stage of labour, slightly jaundiced. Died 29 hours after delivery. Post-mortem: the liver was large (1600 g.) and swollen, with several subcapsular hæmorrhages. On section the cut surface swelled over the capsule and had numerous irregular greyish-yellow necrotic areas surrounded by hæmorrhage. The microscopical section includes a focus (near a portal system not shown in drawing) of necrotic liver cells surrounded by a zone of fatty cells and hæmorrhage. The liver cells show cloudy swelling. (Fig. V.) Stained with hæmatoxylin and Sudan III. (× 90.)

CASE 6.—*Delayed chloroform poisoning.* Girl, aged 17. Admitted to hospital for difficult labour April 21st, 1928. On April 22nd, anæsthetic (chloroform), forceps delivery. On April 23rd, patient drowsy, general condition good. Next day slight jaundice, very drowsy, restless, noisy, knee-jerks exaggerated. Plantar reflex showed extensor responses, some rigidity and spasm of muscles. In evening coma, eyes moving laterally, twitchings of muscles. Jaundice increased. Urine had trace of albumin and some diacetic acid. Death on April 25th. At autopsy the liver was found to be enlarged, soft, and flabby (weight 1800 g.). The colour was yellow with a lobular pattern and subcapsular reddish spots. On section cut surface swelled over capsule. There were yellow areas round central veins of lobules surrounded by red areas, and the periphery of the lobules was grey. Near the hilum there were large areas of yellow necrotic tissue where whole lobules are necrotic. Microscopically central necrosis is seen; the periphery of lobules shows fatty degeneration. (Fig. VI.) Hæmatoxylin and Sudan III. (× 75.)

Pathology of Toxic Jaundice.

From the morbid conditions resulting from the pathological changes caused by the toxic agents which cause toxic jaundice it is clear that the dominant factor in the causation of clinical effects is the damage to the liver cell.

The intensity of the jaundice in any given case is no criterion of the clinical symptoms or of the prognosis as regards life in any given case. Jaundice may be very deep and yet recovery may be complete, without dangerous symptoms supervening, as is seen in epidemic catarrhal jaundice; on the other hand, jaundice may be slight, and dangerous symptoms followed by death may rapidly develop, as in delayed chloroform poisoning and the toxæmias of pregnancy.

Many factors have to be considered, and it must be borne in mind that the same poison may produce any of the morbid histological changes in the liver already described. In one patient this poison may exert its toxic influence *directly on the liver cells*, causing fatal loss of function, while the same poison in another case may exert a less severe action on the liver cells but produce changes in the bile-ducts and intrahepatic fibrous tissue. In the former case jaundice may be slight and death rapid, while in the latter jaundice may be marked and death delayed or averted. This condition of things is well illustrated in poisoning from arsenobenzol derivatives.

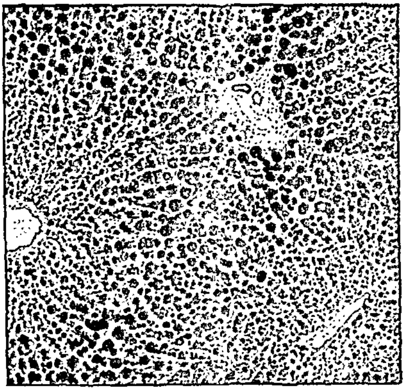
The factors to be considered are the poison, idiosyncrasy, and the time factor.

THE POISON.

Some poisons exert a profound and rapid action on the liver, for example, phosphorus, and death rapidly supervenes, with jaundice of varying degree. Arsenobenzol derivatives, such as salvarsan, may occasionally display this intensive action on the liver cells, causing death in a very few days with symptoms of profound auto-intoxication and only slight jaundice. On the other hand, the symptoms from this group of poisons may be delayed, and deep jaundice may result without dangerous clinical symptoms. The explanation of the variation in action must be the histological damage caused in the liver, and it is clear that this damage is not constant in type for the same poison.

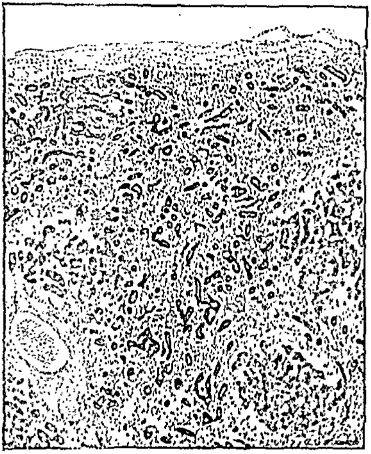
While poisons vary much in their intensity of toxic action on the liver—for example, chloroform is much more toxic than alcohol in its hepatic effects—yet the intensity of action is so variable in different individual cases that the prognosis must always be very guarded when symptoms of toxic jaundice develop, whatever the poison may be. *Epidemic*

FIG. I. (Case 1).



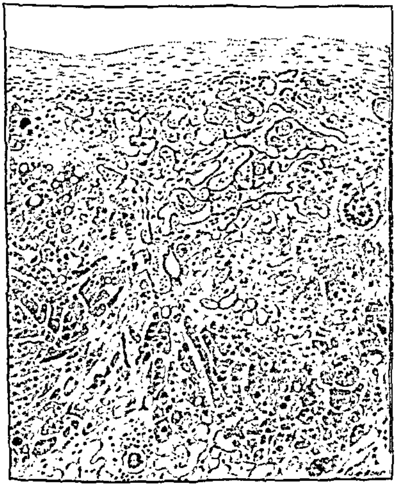
Phosphorus poisoning.

FIG. II. (Case 2).



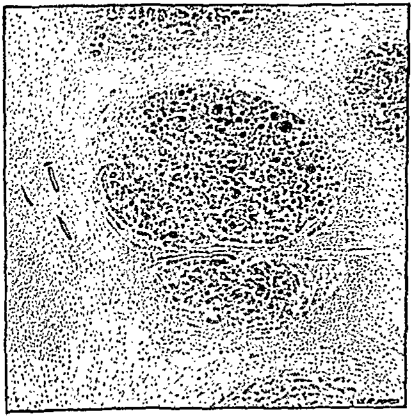
Cirrhosis of liver following N.A.B. injections.

FIG. III. (Case 3).



Subacute red necrosis.

FIG. IV. (Case 4).



Multilobular alcoholic cirrhosis.

SIR WILLIAM WILLCOX: TOXIC JAUNDICE.

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Microscopical examination showed a thickened capsule; large numbers of proliferating bile-ducts; round-celled infiltration and young fibrous tissue; and liver cells, some regenerating and some dying—many containing bile. (Fig. II.) Stained with hæmatoxylin and eosin. (× 60.)

CASE 3.—*Subacute necrosis, toxic jaundice.* (P.M. 228/26.) Male, aged 58. Malaise from Nov. 15th, 1926. On Nov. 22nd, 1926, nausea and vomiting, hepatic discomfort. On the 25th, jaundice set in, which rapidly deepened. On the 27th, the patient was delirious, the stools were pale, and van den Bergh's reaction was biphasic. The Wassermann reaction was negative. The urine contained albumin, granular and hyaline casts. On Dec. 2nd coma developed and death occurred on the 5th. The liver was small (950 g.), soft, and flabby with a mottled yellow and grey surface. On section it was yellow with a few red areas. The microscopical section shows dilatation of sinusoids in areas where liver cells have died and been autolysed. The remaining liver cells have undergone fatty changes and many contain bile. (Fig. III.) Stained with hæmatoxylin and eosin. (× 95.)

CASE 4.—*Alcoholic cirrhosis.* (P.M. 101/26.) Female, aged 54. History of chronic alcoholism for over ten years. Ascites. Paracentesis abdominalis twice in 1926. On June 15th, 1926, hæmatemesis; death on June 18th. The liver was small (1325 g.) and pale, with a coarsely granular hobnailed surface. Section showed coarse strands of pale fibrous tissue uniformly distributed throughout the organ. The spleen was enlarged. Microscopical examination showed regeneration nodules surrounded by fibrous and elastic tissue. Also much fat in the liver cells. (Fig. IV.) Stained with hæmatoxylin, Weigert's elastic stain, and Sudan III. (× 60.)

CASE 5.—*Eclampsia. Toxic jaundice.* (P.M. 66/28). Female, aged 41. Admitted in coma following a fit in the first stage of labour, slightly jaundiced. Died 29 hours after delivery. Post-mortem: the liver was large (1600 g.) and swollen, with several subcapsular hæmorrhages. On section the cut surface swelled over the capsule and had numerous irregular greyish-yellow necrotic areas surrounded by hæmorrhage. The microscopical section includes a focus (near a portal system not shown in drawing) of necrotic liver cells surrounded by a zone of fatty cells and hæmorrhage. The liver cells show cloudy swelling. (Fig. V.) Stained with hæmatoxylin and Sudan III. (× 90.)

CASE 6.—*Delayed chloroform poisoning.* Girl, aged 17. Admitted to hospital for difficult labour April 21st, 1928. On April 22nd, anæsthetic (chloroform), forceps delivery. On April 23rd, patient drowsy, general condition good. Next day slight jaundice, very drowsy, restless, noisy, knee-jerks exaggerated. Plantar reflex showed extensor responses, some rigidity and spasm of muscles. In evening coma, eyes moving laterally, twitchings of muscles. Jaundice increased. Urine had trace of albumin and some diacetic acid. Death on April 25th. At autopsy the liver was found to be enlarged, soft, and flabby (weight 1800 g.). The colour was yellow with a lobular pattern and subcapsular reddish spots. On section cut surface swelled over capsule. There were yellow areas round central veins of lobules surrounded by red areas, and the periphery of the lobules was grey. Near the hilum there were large areas of yellow necrotic tissue where whole lobules are necrotic. Microscopically central necrosis is seen; the periphery of lobules shows fatty degeneration. (Fig. VI.) Hæmatoxylin and Sudan III. (× 75.)

Pathology of Toxic Jaundice.

From the morbid conditions resulting from the pathological changes caused by the toxic agents which cause toxic jaundice it is clear that the dominant factor in the causation of clinical effects is the damage to the liver cell.

The intensity of the jaundice in any given case is no criterion of the clinical symptoms or of the prognosis as regards life in any given case. Jaundice may be very deep and yet recovery may be complete, without dangerous symptoms supervening, as is seen in epidemic catarrhal jaundice; on the other hand, jaundice may be slight, and dangerous symptoms followed by death may rapidly develop, as in delayed chloroform poisoning and the toxæmias of pregnancy.

Many factors have to be considered, and it must be borne in mind that the same poison may produce any of the morbid histological changes in the liver already described. In one patient this poison may exert its toxic influence directly on the liver cells, causing fatal loss of function, while the same poison in another case may exert a less severe action on the liver cells but produce changes in the bile-ducts and intrahepatic fibrous tissue. In the former case jaundice may be slight and death rapid, while in the latter jaundice may be marked and death delayed or averted. This condition of things is well illustrated in poisoning from arsenobenzol derivatives.

The factors to be considered are the poison, idiosyncrasy, and the time factor.

THE POISON.

Some poisons exert a profound and rapid action on the liver, for example, phosphorus, and death rapidly supervenes, with jaundice of varying degree. Arsenobenzol derivatives, such as salvarsan, may occasionally display this intensive action on the liver cells, causing death in a very few days with symptoms of profound auto-intoxication and only slight jaundice. On the other hand, the symptoms from this group of poisons may be delayed, and deep jaundice may result without dangerous clinical symptoms. The explanation of the variation in action must be the histological damage caused in the liver, and it is clear that this damage is not constant in type for the same poison.

While poisons vary much in their intensity of toxic action on the liver—for example, chloroform is much more toxic than alcohol in its hepatic effects —yet the intensity of action is so variable in different individual cases that the prognosis must always be very guarded when symptoms of toxic jaundice develop, whatever the poison may be. *Epidemic* examination on June 24th showed no more change, the condition in the lungs being practically the same as that on the first examination in April. Dr. Stanley Melville, however, made the suggestion that the appearances were similar to those seen in cases of blastomycosis. A later skiagram showed that there was no anterolateral compression of the trachea.

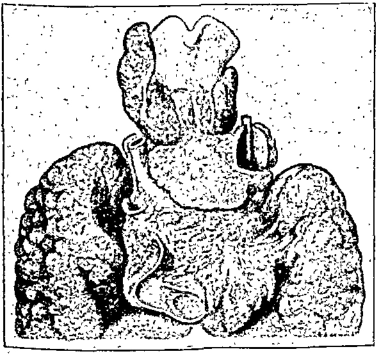
In view of the radiological appearances and the suggestion that enlargement of the thyroid might be the cause of the tracheal stenosis, an attempt was made under a local anæsthetic to investigate the condition of the gland, with a view to removing, if possible, some portion of it or at least dividing the isthmus in order to relieve pressure. Unfortunately the patient's mental and physical condition rendered the undertaking impossible, and the operation had to be abandoned. A small portion of tissue removed showed only fibrous and muscular structure, with no glandular elements.

The girl's condition gradually deteriorated. Her weight decreased, the dyspnœa became more severe, and she was quite unable to stand or even to sit up in bed without grave distress. She went home on Jan. 23rd, 1930, at her mother's desire. She was readmitted for the last time on August 18th, on account of urgent suffocative attacks. She was now extremely emaciated and definitely cyanotic, having to lie propped up in bed and unable to make the least movement. There was some clubbing of the fingers. The chest was extraordinarily flattened from before backwards, and the whole front of the thorax receded with every inspiration, the lower ribs expanding a little in a lateral direction at the same time. There was no enlargement of the liver and no œdema of the legs or albuminuria. The pulse-rate was 112–124, and the respiration-rate 28–34. She died suddenly in an attack of dyspnœa on August 27th, 1930.

POST-MORTEM FINDINGS.

The body was extremely emaciated. There was no œdema of the legs. No enlarged glands were present in the neck. The right lobe of the thyroid gland was much larger than the left. Immediately below the thyroid, but not continuous with it, a firm mass was found which, as will be seen in Fig. 2, was in close relation to the right carotid sheath, and completely surrounded the left carotid sheath. The main bulk of the growth was to the left of the midline, and this portion pressed inwards on the left side of the trachea. On opening the trachea the lumen was found to be markedly stenosed about 1½ inches above its bifurcation. The growth had not, however, infiltrated the tracheal wall.

FIG. 2.



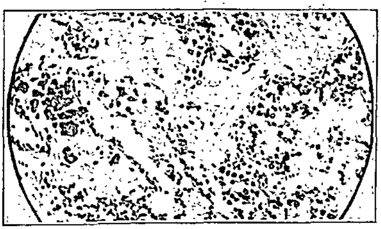
Drawing showing relative size and position of tumour.

There were many fine adhesions between the pericardium and the pleura over the apex of the left lung. The right auricle and ventricle were very dilated. There was no valvular disease. The lungs were small and their surface irregularly puckered. They felt indurated, but some portions, especially in the upper lobes, contained air. On section they presented a congested appearance and oozed blood freely, but throughout the lung substance were seen denser areas of varying size, the average being less than half an inch in diameter. These areas felt indurated and airless, and sank in water. This condition was most marked around the hilum and in the lower lobes, where there appeared to be no normal lung tissue present.

The mediastinal glands were not enlarged. The liver was soft, but there was no nutmeg congestion. No secondary deposits were present. The spleen and kidneys appeared normal.

Sections were made from (*a*) the growth, (*b*) from both lungs, (*c*) from a mediastinal gland. We are indebted to Prof. E. H. Kettle for the following report on the sections :—

FIG. 3.



Section of the tumour. (× 100.)

"The condition is a neoplasm and not an inflammatory or hyperplastic process. I do not think there is evidence that it started in the thymus in the sense that it is composed of specific thymus tissue. The growth contains small calcareous foci (see Fig. 3), but I do not think these represent degenerated thymus corpuscles, but are possibly due to the degeneration of small groups of tumour cells. The dense hyaline stroma suggests a chronic process. As to the actual nature of the growth, I would suggest an endothelioma—derived from vascular endothelium—a hæmangio-endothelioma. Most of the tumour cells consist of little else than small nuclei, but here and there one sees groups of cells which have a definite amount of cytoplasm, and these cells are closely applied to each other. The cells lie in spaces in the stroma in which they are very loosely packed, an arrangement due, I believe, to a primary cell degeneration. I suggest that these cells represent primitive angioblasts which, by a physiological degeneration, tend to produce vascular spaces within their own groups. And I think I can trace this development throughout all its stages in the section."

Pathology of the Tumour.

That the tumour was situated in the thymus is sufficiently proved by its anatomical position and by the presence of normal thymic tissue attached to its lower pole. Probably more of this might have been found elsewhere if the growth had been thoroughly examined and not preserved practically entire, as it was, for the hospital museum. Its malignancy was indicated by the secondary deposits in the neighbouring glands and in the lungs. As it was not apparently composed of thymic elements, it should perhaps be described as *in* the thymus rather than *of* it.

Tumours of the thymus seem to have been first described by Friedleben in 1858, and were well known to Virchow, who noted that the gland was often the starting-point of lymphosarcoma (Voges [1]). Simple tumours, such as fibroma and myxoma, are said to occur in it, and also cysts of various kinds, both developmental and dermoid (Ewing [2]). Lipoma of the thymus is a pathological curiosity; two cases are noted by Yamanoi,[3] and a unique case of mixed tumour (cystadeno-chondrosarcoma), analogous to those met with in the parotid and testicle, was described by Rolleston.[4] Mandelbaum and Celler described a case of tumour which they regarded as a "perilymphatic lymphangio-endothelioma" (Bell [5]). Statistical knowledge of tumours of the thymus practically dates from a paper by Rubaschow (1911), who collected 69 cases. Of these 52 were classed as sarcoma and 12 as carcinoma, with 5 doubtful. Among the sarcomata, lymphosarcoma largely predominated (26 cases being called lymphosarcoma or lymphoma), the remainder including round-celled, spindle-celled, and mixed-celled growths, and one specimen described as sarcoma cavernosum. Two of the sarcomata (recorded by Letulle) were called lymphadenoma, a matter of interest in view of the division of lymphosarcomata by Symmers and Vance [6] into (1) a variety consisting of masses of lymphoid cells, separated by strands of connective tissue (apparently the kind of growth usually described as lymphosarcoma); and (2) tumours histologically resembling Hodgkin's disease, containing giant-cells and eosinophil elements. Gandy and Piédelièvre [7] describe as lymphadenoma a growth which actually infiltrated neighbouring parts, including the heart and the superior vena cava.

The carcinomata of the thymus have been the subject of considerable discussion, as they present peculiar characteristics. Rubaschow noted that one form of cancer may be ill-defined and closely resemble sarcoma, while a second variety takes the form of ordinary "medullary" carcinoma. Other writers speak of small-celled and large-celled varieties of carcinoma of the thymus, and a form of tumour special to this gland (also found in the tonsil) is the so-called lympho-epithelioma, which exhibits a reticulum of epithelial cells containing within its alveoli masses of lymphoid elements. As consisting of the two forms of cells met with in the normal thymus, epithelial and lymphoid, this form of growth may merit the name "thymoma," which has been loosely applied to different forms of growth originating in the gland, including the lymphosarcomata. Pure epithelial tumours or epitheliomata are said to be the rarest form of thymic growth. Symmers and Vance [6] state that only four cases are on record, including one of their own. A case reported by Strauss,[8] not included in their list, is called "squamous carcinoma." Foot and Harrington [9] add a further case which they prefer to term "thymic epiblastoma." Zajewloschin,[10] who attributes the division of carcinomata into small-celled and large-celled varieties to Schmincke, notes that the former were called sarcomata by Letulle; on the other hand, Davidson quotes the recent view of Barnard that many of the tumours in the mediastinum called lymphosarcomata are in reality a form of carcinoma. The only conclusion possible appears to be that the classification of tumours according to their histological appearances is at present unsatisfactory, and that those arising in the thymus, owing to its peculiar histological structure, present peculiar difficulties.

A search, throughout such medical periodicals as were available to us, for cases of tumour of the thymus recorded in the last 12 years (1919–30) does not bear out the relative proportions of the different growths met with by Rubaschow. Possibly more attention has been devoted recently to the carcinomata, as being rarer and so of greater interest; or perhaps, more probably, the basis of classification has changed, many growths previously regarded as lymphosarcomata being now called lympho-epitheliomata. Be that as it may, of 43 instances of which we find adequate records 29 were (so far as we can judge) carcinomata and 14 sarcomata, 10 of the latter being lymphosarcomata. Of the carcinomatous tumours 12 were apparently lympho-epitheliomata, 13 were described simply as carcinomata, and 4 as epitheliomata. The various authors themselves seem to find the differentiation difficult, and the descriptions given are not always easy to follow. The numbers must therefore be regarded as only approximate. Further, we cannot regard the classification itself as free from doubt, in view of the nature of our own specimen, which at first sight definitely suggested a carcinoma and which was so regarded by several pathologists who kindly looked at our sections. The true nature of this tumour was only determined after careful study by Prof. E. H. Kettle, who has devoted much attention to growths derived from the vascular endothelium. It seems not impossible that some of the tumours previously called carcinomata were in reality of the same nature.

Large multinucleate cells resembling giant-cells, and masses like syncytia, have been found in epithelial as well as in sarcomatous tumours of the thymus. Calcification is also commonly found, as in our own specimen. Hassall's corpuscles may or may not be present; their absence does not negative an origin in the thymus gland.

Metastases occur most frequently in the neighbouring lymphatic glands, in the pleuræ, and in the lungs. They may, however, occur at a distance, and have been found in the abdominal glands, the liver, the kidneys, the suprarenal bodies, the stomach, the ovary, and rarely in the bones. They may resemble the parent tumour in containing Hassall's corpuscles and areas of calcification. In one instance the thyroid gland was the seat of a secondary deposit (S. E. Brown [11]).

Symptomatology.

It is not very rare for a tumour of the thymus to be found unexpectedly at necropsy, having given rise to no symptoms during the patient's life. In most cases, however, there is dyspnœa of increasing intensity, often paroxysmal in character, along with cyanosis and œdema of the neck and face, due to pressure on venous trunks. The vena cava superior may be compressed or even penetrated by the growth; the bronchial vessels may also be involved, with resulting hæmoptysis, and in one case a bronchus itself was obstructed by growth. Pleurisy with effusion is not uncommon, and the fluid may be hæmorrhagic; pneumothorax has also been encountered. The pericardium may be involved in the tumour, and even the muscle of the heart may be invaded.

Radiographic examination generally shows a dense shadow extending outwards on either side of the manubrium sterni and downwards into the thorax. In rare instances metastases have given rise to the most prominent symptoms. Thus in one instance enlarged abdominal glands gave rise to a diagnosis of abdominal tumour, and in another, in which the spine was the seat of secondary growth, a paraplegic condition occurred before the primary disease was recognised. A remarkable instance of thymic lympho-epithelioma in which there were metastases in the brain and choroid plexus was recorded by Danisch and Nedelmann,[12] the patient being a child aged 3½ years. A still earlier case is described by Bedford [13] in a new-born baby, the carcinomatous growth causing death by asphyxia, with metastases in the lungs, liver, bones, and skin, these last being indicated by a cutaneous eruption during life.

It is usually stated that sarcomata occur in young patients and carcinomata in older subjects, but the above instances show that the rule is far from absolute. Foot and Harrington [9] also met with an epithelial tumour in a female child aged 2 years. Among the cases which we have collected there were 18 instances of carcinoma in persons over the age of 40, and ten below that age. The sarcomata were more evenly distributed, there being three in the first decade of life, two in the second, three between 21 and 30 years of age, and three between 31 and 40, the remaining two being in persons aged 60. The association of thymic tumours with other diseases is of interest. Friedlander and Foot [14] recorded a case of small round-celled sarcoma in a woman of 38, accompanied by lymphatic leukæmia; they infer that the growth must have been a lymphosarcoma owing to this association—possibly a doubtful argument. The question of the relationship between enlargement of the thymus and this form of leukæmia is discussed by Major,[15] who mentions that Lochte described an "epithelioid transformation" of the gland in acute cases. Bell [5] collected a series of cases of thymic tumours occurring in patients suffering from myasthenia gravis, most of which he regards as having been benign in character, though they were not always so described by the original authors, the lymphorrhages characteristic of myasthenia having been sometimes mistaken for secondary deposits of sarcoma. One case, however, in his series was a genuine round-celled sarcoma with secondary growths in the pleura and diaphragm. An association of thymic tumour with tuberculosis was noted in two instances, but must probably be regarded as accidental. A previous history of attacks of tonsillitis, such as occurred in our own case, is given in the case described by Friedlander and Foot,[14] and Foot and Harrington [9] in another case found the tonsils hypertrophic. In a case reported by Ewing, repeated attacks of tonsillitis had occurred. In view of the frequency of tonsillar inflammation the association in these patients was probably accidental, but the close resemblance in histological structure between the tonsil and the thymus, and the occurrence of lympho-epitheliomata in both these organs, render the association worthy of note.

Diagnosis.

In most cases of thymic tumour the radiographic appearances, along with dullness on percussion over the upper part of the sternum, dyspnœa, and venous engorgement, will enable a tentative diagnosis of the condition to be made. In our own case the diagnosis was rendered difficult by the small size and limited central position of the neoplasm, and by the absence of any marked fullness of the veins. Probably, if the idea of the thymus as the possible seat of trouble had been present in our minds, it would have been considered as a possible explanation of the symptoms. The original diagnosis of tuberculosis of the lungs was rather a matter of convenience than an act of faith, but we find that the same initial error of judgment was made in a case reported by Brannan.[16] The stenosis of the trachea seen in the X ray plates never seemed adequate to explain the degree of dyspnœa from which the patient suffered, and indeed even at the necropsy there seemed a sufficiently wide lumen to the trachea to admit of quiet respiration. Possibly during life, when the parts were full of blood, the degree of narrowing was greater than it appeared post mortem; or perhaps more probably the growth was drawn into the upper aperture of the thorax at each inspiration and acted as a ball-valve, so as to impede the entrance of air. The patient was seen by many physicians during her stay in hospital, and the favourite diagnosis was that of adhesive mediastinitis, with consequent indrawing of the chest walls. The shrinkage of the lungs and consequent exposure of the heart behind the sternum were recognised clinically, but the extreme degree of fibrosis of the lungs was not suspected. Indeed, we do not remember to have seen in any other case so advanced a condition of bilateral fibrous induration and airlessness, or such extreme approximation of the anterior wall of the thorax to the vertebral column and back of the chest.

Treatment and Prognosis.

Lenz [17] records a case in which an epithelial tumour of the thymus was successfully removed by operation and the patient recovered. In our own case this would have been quite impossible, owing to the way in which the neoplasm had grown round the arterial stems, and a similar embedding of the great vessels was noted in the great majority of recorded cases. Instances are reported in which thymic tumours disappeared under treatment with radium or X rays, but in such cases it is impossible to be sure of the nature of the condition. Apart from such means of treatment, the outlook is, of course, hopeless, but the duration of life after the onset of symptoms varies very greatly. Kneringer and Priesel [18] record the case of an old man, aged 71, in whom the disease had apparently lasted for over eight years; on the other hand, a child of 9 years died in 26 days (Miller [19]). A duration of two years is not very rare, but the majority of patients die within a year of the onset of symptoms. In our own case the disease seems to have been present for "several years" before the girl came into hospital, and the tumour must have already attained a considerable size nearly two years before admission when she was conscious of a lump in her throat. It was clearly a slowly growing formation of low malignancy, as indicated by the dense hyaline fibrous stroma, the small amount of glandular infection, and the absence of any visible changes in the pulmonary metastases during the time she was under observation.

Our thanks are due to Prof. Kettle for his kind help and advice; also to Dr. E. E. Atkin, director of the pathological department at Brompton Hospital, for his trouble in preparing sections for examination and mounting the specimen.

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THE INCIDENCE OF OSTEOMALACIA AND LATE RICKETS IN NORTHERN INDIA.

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The ætiology of osteomalacia has roused considerable interest during the last two decades. A survey of recent work [2] suggests that osteomalacia is a true deficiency disease and that its ætiology is the same as that of early and late rickets, the clinical differences being due to a different physiological condition of the bone.

Rickets and osteomalacia are rarely noted in India south of Bombay and Calcutta; the cases on which this report is based were drawn from urban and rural areas in northern India and Kashmir. Four hundred urban cases of late rickets and osteomalacia were kept under observation at special clinics in Lahore, Amritsar, and Simla. Occasional rural cases of rickets and of osteomalacia associated with maternity were seen personally or recorded by doctors and health visitors among village girls and women in the northern Indian plains. Cases were reported among Pathan women of the nomadic *powindah* tribe in the North-West Frontier province, and among Mohammedan women in Kashmir villages. A very high incidence of rickets and osteomalacia was found at all ages, in both sexes, among Hindu field workers in the hilly Kangra district, and a household survey was carried out in a village of this area. The survey of the incidence among children of school age (5-17 years) included observation of children in certain industrial areas as well as of over 2000 children attending school in towns and in country districts.

Table I. and Ia.—*Factors Influencing the Onset in 400 Cases of Late Rickets and Osteomalacia, from Clinics at Lahore, Amritsar, and Simla.*

Race.	M.	F.	Onset before union of epiphyses. Late rickets.		After Ep. U.*
			Age in years.	Cases.	
Hindu (Brahmin, Rajput, Kayasth, Jain, Khatri, Bania, Arora, Chumar, and Mehter)	5	204	5–10	33	
Mohammedan (Sayed, Punjabi, Hindustani (U.P.), Kashmiri) ..	1	150	10	18	
Sikh	—	29	11 12	14 25	
Indian Christian ..	—	11	13 14 15 16	29 34 32 41	
	6	394	—	226	174

* After Ep. U. = Onset over 17 years, after epiphyseal union osteomalacia.

Table Ia.

Relation of onset to marriage	Before	148
	After	252
Associated with pregnancy, lactation, or abortion		218
Associated with illness: fever, 4; pneumonia, 3; cholera, 2; intestina infection, 2; small-pox, 2; disability after accident, 2; measles, 1; abdominal tuberculosis, 1		17
Deficient	Sunlight (housing and purdah). (A familial incidence was observed in 100 cases where sun or diet were very deficient)	240
	Diet	160
Social condition of amily	Poor (coolies, menial workers)	209
	Fair (storekeepers, mechanics, clerks)	174
	Good (merchants, lawyers, officials)	17

Race, Sex, and Mode of Onset.—No race in northern India is immune, but rickets in its various forms—osteomalacia, late rickets, and infantile rickets—is more prevalent in certain castes owing to their mode of life. Under normal Indian conditions the men and boys of a family obtain adequate sunlight and the best of the available diet, so that rickets is rare among them except in conditions of extreme deficiency of diet or sun, as in the Kangra district and in carpet works at Amritsar. The disease is chiefly met with among girls and women during adolescence and maternity (marriage often takes place at the onset of puberty). The incidence of infantile rickets is fairly equally distributed between the sexes. In this series of cases it was rare for the children (all breast-fed) born of osteomalacic mothers to show clinical signs of rickets until their second year; one case of fœtal rickets was reported. The onset of late rickets and osteomalacia, which is often insidious and characterised by intermissions, was found to occur at any age from 5 to 54 years; many cases date from ten years upwards in association with adolescence and maternity (Table I.).

Lines of Investigation.

URBAN.

The housing conditions in crowded areas are such as afford scant opportunity for obtaining much sunlight, and the Indian girl or woman rarely ventures any distance from her home. Observations on the intensity of the ultra-violet solar radiation made by various observers, using Hill's acetone methylene-blue gauze in different Indian towns, give readings in units per day varying according to the season from 3 to 12. These readings are for exposure in the open; in the small dark room which is the poorer city woman's home the results of exposure are nil. Many urban Hindus have only small quantities of milk and fats, ghi (i.e., clarified butter) or vegetable oils, in their diet, which consists chiefly of cereals and cooked vegetables; they do not observe purdah, and derive such vitamin D as they get mainly from exposure to the sun. Mohammedan girls begin to observe purdah from 7 to 10 years of age onwards, and thenceforth have even less opportunity of obtaining vitamin D from the sun. Thus, although the diet of the Mohammedans contains some animal fat and is rather more balanced than that of the Hindus, their mode of living leads to even more deficiency in vitamin D. These diets usually contain an adequate amount of vitamin B, but an excess of cereal plays some part in rendering the condition of the patient worse.

A study of conditions in Ludhiana is instructive. In this town careful inquiry by doctors and health visitors over a period of two years could only disclose five indigenous cases of rickets and osteomalacia. It was found that the diet of the average household did not differ materially from that of women in Amritsar city, where the incidence is high, but in Ludhiana overcrowding was absent and each house received plentiful sunlight, which even those observing purdah could enjoy in open courtyards.

The constituents of the diet of 265 girls and women attending the special clinics were considered in detail, and their symptoms classified according to the degree of severity (Table II.).

Treatment consisted of the administration of some form of vitamin D (cod-liver oil containing that vitamin, or an irradiated substance such as Ostelin or Vigantol, for patients who disliked the use of animal oil), combined with the daily use of milk (not less than 8 ounces), fresh fruit or greens, and sunlight (at least two hours out of doors, with as much direct exposure of the skin as practicable), and massage of the affected parts.

TABLE II.—*Relation of Lack of Vitamin D to Severity of Clinical Symptoms.*

Diet.	Clinical symptoms.			Total cases (265).
	+++	++	+	
I. Absolute lack of vitamin D ..	29	44	12	85
II. Partial lack of vitamin D ..	14	70	71	155
III. Fairly adequately compensated for vitamins D, A, and C	3	2	15	20
IV. Border-line diets (with regard to vitamin content) ..	—	2	3	5

Of the patients treated, 244 attended the clinic regularly for six weeks, and the improvement in their condition was shown by diminution of pain and of muscular spasm with consequent lessening of deformity. Many cases were controlled by X ray examination. The remaining 21 cases did not return for treatment (Table III.).

TABLE III.—*Amelioration of Symptoms After Treatment.*

Diet.	Clinical symptoms.				Total cases (244).
	+++	++	+	−	
I.	—	8	45	23	76
II.	—	22	44	77	143
III.	—	—		19	20
IV.	—	—	—	5	5

Observations were made on the value of the different factors in treatment on 41 girls and women, cases of late rickets and osteomalacia of moderate or severe degree, and the results were controlled by repeated X ray examination. Patients continued to live in their own houses but attended the clinic regularly for at least three weeks, and many were kept under observation for two to five months. They were divided into five groups and treated respectively by the addition of (1) diet (milk and fruit), (2) sun (two hours' exposure daily), (3) vitamin D alone (full dose), (4) diet+sun, (5) sun+vitamin D. Each factor added was partaken of under supervision for a period of three weeks.

The results indicate the importance of food values and a balanced diet in treatment.

Group I., ten patients, all put on weight, although seven of them, who were very poor and living under most unfavourable conditions, had no lessening of pain or spasm. After the three weeks of observation were completed they very rapidly improved on the addition of vitamin D. The remaining three patients belonged socially to the middle class, lived amongst much more favourable surroundings, and were in the habit of obtaining sunlight; their symptoms improved so much that it was unnecessary later to supplement treatment with vitamin D.

Group II., five patients, all wives of industrial workers on small wages having a very unbalanced diet, showed no obvious improvement, but when, after three weeks' treatment, vitamin D was added, their symptoms cleared up slowly.

Group III., twelve patients, improved slowly under treatment.

Group IV., seven patients, improved slowly under treatment.

Group V., seven patients, improved under treatment considerably more rapidly than Group III.

Massage or galvanic baths are useful in easing pain; exercises are also helpful. Indirect ultra-violet irradiation can, if necessary, be substituted for exposure to sunlight. Experiments have been made with the use of Indian fish oils, and also attempts to get irradiated substances manufactured on a commercial scale in India, but so far unsuccessfully.

RURAL.

In the Kangra district the population in proportion to the cultivated area has reached a limit already exceeding the capacity of the country to support it. A household survey was carried on in a village called Launa (altitude 4300 feet). The inhabitants are field workers and accustomed to open-air life. Plentiful sunshine is available for eight months in the year; in the remaining four there are rains and mist, and during this period patients state that their pains are worse. Village families fall into three groups: chumars, the lowest social class in the village, in which the men and women are field workers on other people's land; zemindars, usually cultivating their own land; and Gurkhas, the families of military pensioners (Table IV.).

TABLE IV.—*Rickets and Osteomalacia among Inhabitants of Launa Village, Kangra District. Relation of Caste, Sex, Age, and Diet to Severity of Clinical Symptoms.*

Average daily diet.		Age under 17 years. Rickets.			Age over 17 years. Osteomalacia.			Total cases.
		Clinical symptoms.						
I. Chumar (109 persons examined).								
		+++	++	+	+++	++	+	
Milk, —; dal, 2 oz.; fruit, —; rice, ¾ lb.; cooked vegetables, rarely; ghi, ¼ oz.; atta, ¾ lb., +vegetable oil	M.	—	6	16	1	7	10	40
	F.	2	3	12	11	11	4	43
II. Zemindar (47 persons examined).								
Milk, —; dal, 2 oz.; fruit, —; rice, 1 lb.; cooked vegetables, every third day; ghi, ¼ oz.; atta, ¾ lb.; extra oil used for cooking	M.	—	—	8	—	—	—	8
	F.	—	1	4	—	2	1	8
III. Gurkha (13 persons examined).								
Milk, 4 oz.; dal, 1½ oz.; fruit, occasionally; rice, 8 oz.; cooked vegetables, daily, ghi, 1 oz.; atta, ¾ lb.; meat every third day; extra oil used for cooking ..	M.	Nil.			Nil			Nil
	F.	„			„			„

M.=male; F.=female.

The addition of vitamin D, together with milk and fruit, daily to the diet caused rapid improvement in the condition of 27 cases; it is, however, impossible for these patients to continue such diet on their own earnings (Table V.).

Since the Kangra district lies in the Himalayan tract, goitre is prevalent, but it does not occur more frequently among cases of rickets or osteomalacia, nor does their improvement on treatment cause any decrease in the goitre. Goitre is rarely present among urban or rural cases in the plains.

TABLE V.—*Ameliorating Symptoms among Chumar Women and Girls of Launa Village.*

—	Age under 17 years. Rickets.				Age over 17 years. Osteomalacia.				Total cases.
	Clinical symptoms.								
	+++	++	+	−	+++	++	+	−	
Before treatment..	2	3	—	—	11	11	—	—	27
After treatment ..	—	—	1	4	—	—	8	14	27

Examination of Children of School Age.—Rickets was associated with lack of sunlight in overcrowded schools, and also with deficient diet in industrial areas (Table VI.).

TABLE VI.—*Incidence of Rickets among School-girls (Ages 5 to 17 Years) in Lahore.*

Classification of schools.	Girls. examined.	Cases of rickets.
1. Intramural congested city ..	783	422
2. Extramural city	415	135
3. Well-planned suburban ..	284	50
Total	1482	607

Summary.

A high incidence of rickets and osteomalacia was found in overcrowded cities and in towns with narrow lanes and high sunless houses, or in densely populated bazaars among Hindu and among purdah-observing Mohammedan women and girls. The diet of such patients was found to be deficient in vitamin D and in certain cases in vitamins A and C also. In rural areas, when diet is markedly deficient, adequate sunlight cannot prevent rickets or osteomalacia.

Investigation of the diet, housing, and customs of over 1500 cases of rickets and osteomalacia in northern India shows that a consistent lack of vitamin D in connexion with diet and lack of sunlight is an ætiological factor, thus confirming the experimental findings in various parts of the world. Improvement in diet causes but little improvement in symptoms if sunlight is deficient; conversely the provision of sunlight for cases on very deficient diet is of little use. The results of treatment show that cases on full doses of vitamin D improve gradually, but in order to get more rapid results it is advisable to combine the use of a moderate dose of vitamin D with daily exposure to sunlight and an improved diet (i.e., the addition of vitamins A and C). There is also much value in thus training patients in a better mode of life.

A grant-in-aid towards the cost of this inquiry was received from the Punjab Government. Throughout the inquiry much helpful criticism was received from Surgeon-General J. W. D. Megaw. I also wish to express my indebtedness to the following collaborators: Ella Surie, M.Sc. Lond., with regard to dietary factors in the ætiology of osteomalacia, and also a preliminary inquiry on the incidence of rickets and dental caries in India; Gulbai P. Patel, M.B. Lond., with regard to the blood-picture; and W. K. Coombes, M.R.C.S. Eng., with regard to the radiological examinations in connexion with factors in treatment. An X ray study of osteomalacia was undertaken independently by V. E. Pilley.[1]

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ACUTE ASEPTIC MENINGITIS.

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At the present time there are appearing throughout the world an increased number of unusual, little understood, infections of the central nervous system, such as post-vaccinal encephalitis and diffuse encephalomyelitis. In view of this we should like to call attention to another type of case which is apparently becoming commoner in this country and which has recently appeared in small epidemics on the Continent, especially in Germany and Scandinavia. It closely resembles tuberculous meningitis—in fact, this is the diagnosis confidently made in practically every case—and since the prognosis is absolutely good, the differential diagnosis is obviously of great importance.

Nomenclature.

The cases show an extraordinarily similar onset and course, and this is one of the main features of this disease which we have termed "acute aseptic meningitis." It is not a new disease. Cases of this type have long been known and described under various terms—benign aseptic purulent meningitis (Schiff[1]), acute idiopathic benign serous meningitis (Andersen and Wulff[2]), epidemic meningitis serosa (Eckstein[3]), acute aseptic meningitis (Gunther[4]), &c. In the absence of more definite knowledge this last name seems the best. At present it is not known if all the cases have a similar ætiology; it is possible, even probable, in spite of the uniformity of the clinical picture, that they have not.

The cases are called "aseptic meningitis," since no organisms have yet been found in the cerebro-spinal fluid. The "serous meningitis," so well-known to otologists, at first sight seems to be something of the same nature—the early stage of a definite meningitis due either to some organisms of low virulence or to organisms as yet remote from the meninges. The increase in cells and protein indicates that the inflammatory process is just reaching the subarachnoid space: in the serous meningitis complicating otitis media these cells are lymphocytes at first, to be superseded by polymorphs later when the inflammation is extending. The onset is subacute, and the clinical picture reaches its climax slowly; then the signs either slowly disappear or a frank meningitis gradually develops. It is easy to visualise here the gradual invasion of the meninges by pyogenic organisms, a mild pyogenic meningitis which the body overcomes. In aseptic meningitis, however, we are faced with a dilemma; the uniformly abrupt, even fulminating, onset, and the severity of the clinical picture seem to indicate an infecting organism of high virulence, yet the short course and rapid regular recovery and the absence of any known organisms in the cerebro-spinal fluid are all against this. The change during the course of the disease from a predominance of lymphocytes to polymorphs in the cerebro-spinal fluid never occurs in aseptic meningitis: either lymphocytes are found in excess throughout the whole illness, or polymorphs predominate at first and there is a lymphocytic predominance later.

Acute aseptic meningitis has the following characteristics for its definition:—

1. An acute onset with definite meningeal signs.
2. Meningeal changes in the cerebro-spinal fluid; there is an increase of pressure and of cells—but the fluid is sterile on culture.

3. A uniform clinical symptomatology.
4. A relatively short benign course without secondary complications.
5. No epidemiological connexion with any known infectious meningeal disease.
6. There is no local infection, such as otitis media or sinusitis.

History.

Sporadic cases answering to the above definition have long been known, and it is highly probable that many of the cases published as healed tuberculous meningitis are of this type. The records of many of these cases are now too old or too incomplete to be of much value.

In 1910 a small series of 14 cases were reported in Paris under various names: Laubry and Foy,[5] syndrome meningé avec lymphocytie rachidienne d'origine indeterminée (3 cases); Rist and Rolland,[6] méningite benigne d'allure épidémique (5 cases). These cases were absolutely typical. At the same time Guillain and Richet[7] published four cases of benign lymphocytic meningitis complicated with jaundice; and Rist[8] showed that many cases of benign infectious jaundice were occurring simultaneously in the Paris hospitals. The jaundice was of the obstructive type—excess of bile in the serum and urine, and no bile in the stools—and the liver was slightly tender but not enlarged. This was accompanied by mild fever, severe headache, and a marked lymphocytic reaction in the cerebro-spinal fluid, but few signs in the central nervous system. Blood examination in one case showed a leucocytosis of 30,000, 93 per cent. of which were polymorphs. No jaundice, however, has been noticed in any case reported since 1910. These earlier case reports have been well reviewed recently by Roch, Martin, and Monedjikova,[9] and will not be dealt with here, since they present no unusual features.

From 1910 to 1925, little or no mention is made of acute aseptic meningitis, and then Wallgren,[10] in a paper entitled, A New Infectious Disease of the Central Nervous System, described a small Swedish epidemic of 19 cases. His cases also were typical.

Symptoms.

The onset is very acute with definite meningeal signs, the previous health being usually quite good; occasionally there is malaise for a few days, but as a rule there are no abnormal symptoms. Suddenly the patient becomes very ill, most children being so ill that they are thought to be in danger of their lives. The most common meningeal signs are headaches, which are severe and mostly occipital, vomiting, and stiff neck; pains in the neck and limbs are often severe, and there is intractable insomnia. Spinal signs are frequent: in bad cases there is marked rigidity of the back and stiffness of the neck, and the patient lies in a meningeal position; in the milder cases rigidity is only shown by a positive Kernig or Brudzinski's sign. The patient is extremely sensitive to movement and the reflexes are everywhere very active. Cerebral signs are much less marked; consciousness is usually not affected, and lethargy is never seen. There is marked dermographism. Convulsions are uncommon except in very young children. If the child is young enough, the fontanelle is found to be bulging. Teeth-grinding is often noted as a symptom. Eye signs are frequently found, the commonest being nystagmus, squint, and photophobia. Papillœdema has been noted in some cases, also hæmorrhage into the fundus (Eckstein[3]), and in some the pupils are unequal and react sluggishly to light. Apart from a facial palsy, which is rare, the cranial nerves are normal. Haessler, Eckstein, and others emphasise the fact that most of the children have sore-throat or severe nasopharyngitis, from which hæmolytic streptococci can be cultured. Some have ulcerative stomatitis.

The abdomen is usually retracted, with active reflexes, and there is no enlargement of the spleen or liver; constipation is the rule. No physical signs are found in the respiratory tract. Some authors mention a slow pulse, but this is not constant.

At the onset *fever* is usually high, continuous, or remittent, while a few of the reported cases are subfebrile. The duration of fever is short—from 3–13 days, averaging seven days. In the rapid cases it falls by lysis after the first few days, while in the stormy cases, after the fall, there may be a recurrence of intermittent fever for a few days.

Cerebro-spinal Fluid.

On lumbar puncture the cerebro-spinal fluid is found under pressure, sometimes markedly increased. The fluid is clear or sometimes cloudy; in a few cases reported it was purulent. In three of Eckstein's cases there was a definite spider-web clot. The cells vary in number, from 60 to a maximum of 1500 being reported; the average case shows about 100–250 cells. These are mainly lymphocytes, but at the onset of the disease polymorphs may predominate, to be replaced by lymphocytes later, this change often being quite rapid. In one case of Laubry and Foy the cells in the cerebro-spinal fluid were as follows:—

		Per cent.		Per cent.
March 17th ..	Polymorphs	95 ..	Lymphocytes ..	5
,, 18th ..	,,	90 ..	,,	10
,, 20th ..	,,	35 ..	,,	65
,, 23rd ..	,,	10 ..	,,	90

A typical case illustrating this transition is reported by Schiff.[1]

Baby of 11 months, admitted on March 28th comatose, with fever, bulging of the fontanelle, and a marked stiff neck. Kernig's sign was positive and both plantar responses were extensor. Pirquet test positive. Pupils and cranial nerves normal. Marked dermographia; retracted abdomen. Urine normal. Blood count: 16,000 leucocytes, of which 41 per cent. were lymphocytes, 50 per cent. polymorphs, and 7 per cent. monocytes. Lumbar puncture produced purulent fluid under pressure; numerous polymorphs, but very few lymphocytes. No clot; no tubercle bacilli; no organisms seen or cultured. Protein++. "Sugar reaction" negative.

April 1st: Clinical condition unchanged but now more lymphocytes than polymorphs in the cerebro-spinal fluid. 3rd: Temperature 103°. Stiff neck more marked; restless, sleepy, and rolling the eyes about.

April 8th: Well and playing in bed. No signs of disease in the nervous system; cerebro-spinal fluid clear.

April 21st: No increase of cells in the cerebro-spinal fluid. Examined three years later, entirely normal.

In Andersen and Wulff's cases[2] reported from Denmark, 27 cases showed exclusively or mainly lymphocytes; in two cases there were an equal number of lymphocytes and polymorphs and in three cases polymorphs predominated, the actual counts being 150/3, 3100/3, 165/3. In the last case the cerebro-spinal fluid later in the course of the disease showed mainly lymphocytes, the actual figure being 1500/3. (Andersen and Wulff consider that these last cases must be considered as acute aseptic meningitis since the clinical course was entirely similar. I shall refer to this later in dealing with differential diagnosis.)

The protein in the cerebro-spinal fluid is increased, Pandy's reaction being always positive. The sugar content is normal, varying from 0·03 to 0·06 per cent. The cerebro-spinal fluid, cultured aerobically and anaerobically many times by different observers, has always been sterile; no tubercle bacilli are found, and guinea-pig tests have always been negative.

CLINICAL AND LABORATORY NOTES

ARTERIAL THROMBOSIS ASSOCIATED WITH NEUROFIBROMATOSIS OF THE LUMBAR SYMPATHETIC CORD.

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AND

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THE condition of thrombo-angeiitis obliterans has of recent years become more generally recognised and the literature of the subject is already considerable. In spite however of an increased knowledge of the clinical features of the disease we seem unfortunately no nearer to a solution of its ætiology. Racial pecularity, tobacco, cold, and hyperadrenalinæmia have each been invoked as a cause, but so far without conviction. We desire to place on record a case of extensive arterial thrombosis of the lower limbs in which a very definite and possibly causal lesion was found at operation on the lumbar sympathetic cord.

FIRST ADMISSION: AMPUTATION.

X. Y., male, 43 years, British born, an engineer's fitter, was admitted to the Manchester Royal Infirmary in February of this year. He stated that two years before admission he had noticed difficulty in walking and was obliged to rest after walking about 200 yards owing to severe pain in the calf of the left leg. The condition got steadily worse and within a short time began to develop in the right leg. For some weeks before admission he had been confined to bed and had suffered greatly from continuous severe pain and loss of sleep.

On admission, the left lower extremity showed gangrene of the great toe and a large patch of gangrene on the dorsum of the foot involving also the fourth and fifth toes. The circulatory condition of the limb was very grave; no pulsation could be obtained below the common femoral artery at Poupart's ligament. The right leg was also seriously involved but showed no actual gangrene; a slight pulse could be felt in the superficial femoral artery on this side.

The man's general condition was critical; he was weak, emaciated, and in a state of constant rambling delirium, due no doubt to septic absorption and want of sleep. The case appeared to present the clinical features of thrombo-angeiitis obliterans of a somewhat rapid course.

Investigation of the patient showed that the Wassermann reaction was negative, the coagulation time of the blood was one and three-quarter minutes, and the blood calcium registered 10 mg. per 100 c.cm. The patient had always worked under cover and he was stated to have been a hard-working and steady man with no previous illness; his consumption of tobacco was about 20 cigarettes daily.

It was obvious from his condition that the only treatment possible was a supracondylar amputation of the thigh and this was done at once. The operation was followed by a prompt recovery, the delirium disappeared, his general condition improved, and he was discharged at the end of a fortnight with a well-healed stump.

A very complete dissection of the arteries of the amputated limb was made and many sections of all the named arteries and several smaller vessels were examined. All showed obliteration by well-organised and partially canalised fibrous tissue with the exception of the anterior tibial artery, in which the lumen was patent and but slight changes visible in the wall.

SECOND ADMISSION: LUMBAR SYMPATHECTOMY.

Early in April some six weeks after his discharge he was readmitted with gangrene of two toes and the heel of the right foot. It was decided to try the effect of lumbar sympathectomy and this was done on April 25th. Under spinal anæsthesia the right lumbar sympathetic cord was exposed by the retro-peritoneal route. Overlying the sympathetic cord was a chain of slightly enlarged lymphatic glands and on removal of these the cord was found to be very greatly thickened. The second lumbar ramus was identified and above this point the cord appeared normal. On tracing the cord downwards, the thickening was found to extend to the lower border of the common iliac artery where it broke up into perfectly normal branches. The whole cord from above the second lumbar ramus to its point of division into pelvic branches was removed.

A striking and immediate effect of the operation was the complete relief of the severe pain from which the man had suffered, and this relief of pain has so far been complete and permanent. Within 24 hours it was evident that the condition of the limb had improved; it was warmer, and the skin exhibited a better colour. The gangrenous areas also began to heal and within six weeks the large slough of the heel had been cast off, leaving a healthy granulating surface. A line of demarcation formed at the base of the two gangrenous toes, which are now rapidly undergoing spontaneous separation. The man has recovered his normal mental and physicial condition; he has required no anodynes since the night of operation, whereas before operation he was constantly under the influence of morphia.

THE EXCISED CORD.

An examination of the excised lumbar sympathetic cord shows the following features: the thickening of the cord was quite uniform and no nodular enlargements or irregularies were present. The transverse diameter throughout the affected portion was increased to some six times the normal size.

Sections were cut and stained with hæmalum and eosin, Mallory's connective tissue stain, toluidin blue, and van Gieson's stain. Microscopic examination at once revealed the fact that the enlargement of the cord was due to a great increase in the amount of supporting tissue. The nerve-cells stained normally and appeared to be perfectly healthy; they were scattered somewhat diffusely, as is not uncommon in this part of the sympathetic cord, but the cells were separated from one another more widely than usual owing to the increase in the amount of connective tissue around them. Large numbers of healthy nerve-fibres were to be seen and these were surrounded individually, or in small groups, by a dense fibrous tissue. It was significant to observe that the overgrowth of fibrous tissue was obviously more pronounced in the neighbourhood of nerve-fibres than it was around the nerve-cells. It was, however, in both situations excessive in amount and definitely more dense than normal. A careful investigation by suitable staining methods was made by Dr. E. R. A. Cooper with the object of discovering whether any trace of neuroglia was present, but none was found after a prolonged search.

The histological picture may be summed up as one typical of neurofibromatosis and the appearances suggested that the fibrous infiltration of the cord was capable of inducing irritation of the nerve-fibres.

An examination of the excised lymphatic glands showed that their enlargement was due to an old-standing quiescent tuberculosis infection; their condition appeared to bear no relation to the changes found in the sympathetic cord.

Comment.

The findings in this case raise several points of interest. In the first place the sections of the arteries from the amputated left leg showed changes closely resembling those which have been described by Buerger [1] and seen by us [2] as characteristics of thrombo-angeiitis obliterans. There are, however, despite a superficial resemblance, some points of difference. The most striking of these is the absence of fibrosis around the vessels or of any thickening of the adventitia. Thickening of the intima and great increase of elastic tissue were commonly found; these features were distinctly more pronounced than we have ever observed in cases of undoubted thrombo-angeiitis obliterans. The typical collections of lymphocytes during the organisation of thrombi were not found, nor were any giant cells seen. Marked fibrosis of the tunica media was almost a constant feature, but no evidence of lymphocytic infiltration was found.

The second point of interest is the association of neurofibromatosis of the lumbar sympathetic cord with the vascular changes in the domain of the vaso-constrictor fibres which reside in that part of the sympathetic system. The histological picture suggested strongly that these sympathetic fibres were subjected to irritation by the fibrous tissue around them. In previous papers[3 4] we have submitted evidence which indicates that sustained irritation of vasoconstrictor fibres can produce vascular changes, and in the more recent communication we have suggested a theory as to how these changes may be induced. It seems reasonable to state that we have in this case which we now report another example of the same process, though of a different form from any we have yet reported.

A third feature worthy of comment is the immediate disappearance of pain after excision of the sympathetic cord. This relief of pain has been noted by other observers and it seems that one may confidently expect it after this operation. The cessation of pain might, at first sight, be interpreted as indicating the division by the operation of sensory fibres from the diseased blood-vessels, but there are a number of reasons which render such explanation quite untenable. We submit that it is a direct result of the vasodilatation which ensures that some substance is flushed out of the tissue spaces. We agree with the view recently expressed by Sir Thomas Lewis in his St. Cyres Lecture[5] that the primary cause of the pain is the accumulation in the tissue spaces of some substance which cannot be removed by the impaired circulation.

During the last six years we have been able to study closely some 40 cases of thrombo-angeiitis obliterans and we have found in no case evidence of a nervous lesion associated in a causal relationship to the disease. It is obvious that no definite deduction can safely be made from an isolated case, but it is possible that, although this patient presented many features which would appear typical of thrombo-angeiitis obliterans, we may in reality be dealing with an undescribed disease closely resembling thrombo-angeiitis obliterans but dependent upon a different and hitherto unsuspected cause.

We place the case on record, therefore, in the hope that it may stimulate further inquiry on these lines. We suggest that the operation of excision of the lumbar sympathetic cord should be practised more frequently in cases of thrombo-angeiitis obliterans. It seems probable that it may save amputation or at least considerably lower the level of amputation. Since it is clear that the beneficial result of the operation must depend upon the number of vessels which are still sufficiently unaffected to be able to dilate, the intervention should be done at as early a date as possible, preferably before the onset of gangrene. We would, in the light of our findings in this case, urge a very complete histological examination of the excised cord.

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A CASE OF DUPUYTREN'S CONTRACTURE.

BY W. A. TRUMPER, M.R.C.S. ENG.

IN June, 1930, I was consulted by a single woman of 65 on account of the condition of her right hand. The ring finger was bent so much that the tip was level with the base and the little finger was flexed to about half this extent, the other fingers being normal. Neither of the affected fingers could be straightened, and two small tender nodules could be felt beneath the skin to the ulnar side of the middle of the palm. The patient attributed her condition to the use of a chopper in cutting wood. It was a typical Dupuytren's contracture.

Wishing to try the effect of local treatment before advising operation, I prescribed a thorough inunction of the palm twice daily with ung. iodi. denigrescens. After about 10 days the treatment had to be suspended on account of a local dermatitis of the palm with the formation of blisters. Movement was already returning in the affected fingers, and, after a second course of inunction, which also resulted in blisters, they could be fully extended. The nodules in the palm had also nearly disappeared, but the grip, however, was weak, and when flexing all the fingers to form a fist, the tips would not quite touch the hand. Subsequent exercises have rendered the hand quite useful, and in appearance perfectly normal. The patient states that she still notices a slight weakness of grip when wringing clothes.

It seems to me doubtful whether the improvement noted in this case was due to the iodine absorbed, or to the hyperæmia which accompanied the dermatitis. In either case it suggests a possible method of treatment for a troublesome condition.

Ivybridge, S. Devon.

METASTATIC DEPOSITS IN PRIMARY ADENOCARCINOMA OF THE SINUS PYRIFORMIS.

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A NATIVE Christian male, aged 35, sought advice for hoarse voice and increasing difficulty in swallowing. A hard mass could be felt in the right anterior triangle of the neck, fixed to the deeper structures. On indirect laryngoscopic examination a fungating growth was visible on the right aryteno-epiglottidean fold extending over the sinus pyriformis, as well as on the inner surface of the mucosa lining the arytenoid cartilage.

The growth being inoperable, an antiseptic mouth-wash and anodynes were prescribed. The patient was steadily going down hill, and it was found he had lost power in one arm and leg on the same side. A blood Wassermann test was negative. He was placed on a course of iodides, for the hemiplegia was supposed to be due to cerebral thrombosis. He had no headache or vomiting, and was conscious. (The fundus was not examined.) He had no pulmonary symptoms. He slowly died of asthenia.

At autopsy the right occipital lobe of the brain was found to be infiltrated with a growth the size of a lemon, soft in consistency, and bluish in colour. A similar mass the size of a chestnut was found at the apex of the left lung. Microscopical examination of the larynx, brain, and lung (affected areas) showed adenocarcinomatous changes. The only explanation for the hemiplegia of gradual onset was a microscopic invasion of the fibres of the internal capsule by the forward extension of the occipital growth.

It is possible that distant metastasis from laryngeal carcinoma is more common than is supposed. These cases should be seen early, and a very extensive dissection should be carried out.

MEDICAL SOCIETIES

ROYAL SOCIETY OF MEDICINE.

SECTION OF OTOLOGY: SUMMER MEETING.

THE summer meeting of this section took place at Queen's College, Oxford, on June 26th and 27th, the President, Mr. ALEXANDER TWEEDIE, being in the chair.

Dr. W. T. HILLIER (Birmingham) read a paper, supported by a series of large water-colour drawings, on the

Lateral Line Sense-Organs of Fishes.

The term "lateral line" signified a row of organs of special sense extending from the head backwards along the sides of the body; it was found only in creatures which led an aquatic life—i.e., fishes and amphibians. Not all kinds of fish had a lateral line; for example, neither the herring nor the mackerel had. Some fishes, such as necturus and amblystanaæ, had three lines on each side. The lateral line could be regarded as a poor relation of the human labyrinth. The auditory labyrinth had all the interest of a machine designed to fulfil a certain group of purposes, and consisted of a standing part and a moving part. It consisted not only of special nerve-endings, but also of accessories which served to protect those end-organs and improve their efficiency. Buddenbrock had stated, and had related experiments which supported that view, that there existed a definite functional relationship between the semicircular canals and the sense-organs found in the skin of many aquatic animals; and that the lateral line organs served for the perception by the fish of streaming water. Whether a fish moved against the stream or stayed in one spot was determined by visual stimuli. The lateral line was only part of a system of lines of special sense-organs, known as the neuromast system, because the end-organs were shaped somewhat like a nipple; there was also a series of lines over the head. In fishes which had scales, the canals of the lateral line pierced the scales, and usually there was one sense-organ to each scale. The organs of the lateral line proper were supplied by the lateral branch of the vagus, but those on the head by other cranial nerves. There existed in fishes also an acustico-lateral system. The marks in the bones caused by the acustico-lateral or neuromast system could be found in some of the very earliest forms of fish. The row of markings of the lateral line extended in an unbroken sequence along the body, often to the tail, so that the line must not be regarded as a series of segmental organs; it seemed to be no more than a repetition of one type of structure. Discussing the subject in the light of Darwin's views expressed in the chapter on Domestication in "The Origin of Species," he said that the alternation of generations was not an occasional curiosity, but a regularly recurring event in the phylogeny of animals, and quoted a number of instances of it. The development of the lateral line had been well shown by Henry Wilson in his account of the embryology of the sea bass; Beard had studied the development of the lateral line in the trout. Dr. Hillier himself had never been able, in his successful sections, to trace the nerves going to or from sense-organs; the nerve strand appeared to be incorporated in the epithelial lining of the canal. The sense-organs seemed to be concerned with the reception and interpretation of vibrations conveyed by water, and in the case of the amphibiæ the skin grew over the sense-organs during the terrestrial part of their existence. The most important contribution on the subject, so far, was that of G. H. Parker, in 1905. Parker found little to support the view that the lateral line was concerned with equilibration, and it was much inferior in this respect to the eye or the ear. Dr. Hillier's own experiments had shown that the lateral line on the underside was the sensitive one to external stimuli.

The PRESIDENT asked whether any connexion had been traced between the innervation of the lateral line organ and that of the utricle.

Dr. MUIR EVANS (Lowestoft) said he had tried to find out more about the connexion of the lateral line with the central nervous organisation. Herrick had pointed out that the great size of the vagal lobes in goldfish and carp was due to the fact that the fish received the sensation from the palatal organ in the roof of the mouth, which was covered by taste buds. A valuable line of investigation was on the relation of the acoustic lobe.

Mr. H. M. MACNAUGHTON-JONES submitted, and demonstrated by a series of models, some new conceptions on the

Physiology of the Ear.

It was currently taught and believed, he said, that the manubrium moved inwards and pushed in the stapes. The latter was supposed to be possible only by the pushing in of the foramen rotundum. His view, which the working models supported, was that a wave striking the membrana tympani caused the manubrium to move outwards, the foramen rotundum was pressed inwards, and the manubrium drew the stapes outwards. He did not found his new conception on the models, but made the models to prove his belief. He emphasised the great importance of maintaining a certain degree of tension on the stapedius muscle; it was also important for hearing that the stapes should be movable, and that the malleus should be tense.

The PRESIDENT said he believed that the tympanic membrane acted only as a protector of the contents of the middle ear. The functional integrity of the stapes seemed to be important, but the other two ossicles he regarded as of little importance, otherwise how could such excellent hearing exist with total defect of the tympanic membrane and a tolerant middle ear? Barany had recently suggested that in conversation sound was essentially transmitted through the foramen ovale, the incursions of which were balanced by the excursions of the foramen rotundum. Recently it had been shown that for lower tone perception the functional integrity of the stapes was absolutely necessary. The chief route of higher tones was directly through the foramen rotundum.

Dr. LOWNDES YATES said that various theories were held as to the function of the ossicles, but presumably the elaboration of a joint between the incus and the malleus was not without good reason. A similar joint existed between stapes and incus. It seemed that sounds of very short wave-length must be physically absorbed by those joints, so that the sounds of higher pitch must get to the internal ear by some route other than by the membrane; the choice of route must be between the oval window and the round window. After removal of the ossicles and the tympanic membrane, the tuning-fork could still be heard, though lower notes did not come through so well. Hearing diminished pari passu with the onset and increase of fibrosis in the wound which had been made. The tensor tympani enabled the ear to rest, to cease listening when something was transpiring which the person did not want to hear.

Mr. ERIC WATSON-WILLIAMS agreed with the President that the ossicles and membrane had not much to do with hearing; and he pointed out that the argument advanced by Mr. Macnaughton-Jones rested partly on the assumption that the membrane was not elastic, whereas for the purpose it had to serve its elasticity was practically perfect, and it offered virtually no impediment to the transmission of waves of pressure.

Dr. E. A. PETERS read a paper on a case of

Cerebellar Abscess Drained Anteriorly to the Lateral Sinus.

The patient was a woman, aged 29, seen last April, who in 1917 had had a double mastoidectomy. There had been an intermittent discharge since then. For some months she had had headache which latterly had become more persistent; felt over the whole head, but chiefly in the occipital region. On the day of admission she vomited for the first time. The temperature was 99° F., pulse 116, urine, sp. gr. 1030, acid. Later the head was retracted and she had Kernig's sign and diminished abdominal reflex. Cholesteatoma with meningitis was diagnosed. At operation a large cholesteatomatous excavation was found in the petrous bone. The tegmen tympani was removed, and the temporo-sphenoidal lobe exposed by enlarging the wound upwards. On incising the dura mater the cerebrum bulged outwards but did not protrude. Infection of the labyrinth was negatived by the satisfactory condition of the cochlear nerve and the absence of nystagmus; therefore the other possible infecting area anterior to the lateral sinus was removed by a gouge. The underlying dura was found to be softened, and was readily divided, and a few ounces of pus escaped, indicating an intradural or superficial cerebellar abscess. The puncture was perfused daily, and b.i.p. dressing was applied during the first week, paraffin and flavine later. There had been no defined focal indication of cerebellar abscess. Dr. Peters stressed the value, in early acute cases, of packing off the infecting petrous bone from the dura mater with b.i.p. after performing mastoidectomy, with removal of the diseased areas of bone.

Dr. PETERS also read a paper on a

Test for Maximum Tuning-fork Hearing.

He said that tuning-forks still yielded very useful results in testing hearing, and the value of those results was increased if fractional representation was used, the nominator representing the observation time, while the denominator expressed the normal time in seconds. Jointly with Mr. R. Lake he had pointed out that an even pressure of 8 oz. eliminated the variations due to the amount of pressure. In a man aged 23 in the silence room the following standard results were obtained:—

Tuning-fork of 128 vibr.	Seconds.	Tuning-fork 256 vibr.	Seconds.
1. Applied to mastoid ..	27	1.	30
2. Tuning-fork on mastoid with tragus closing meatus	27	2.	55
3. Tuning-fork held half an inch from meatus	27	3.	95
4. Tuning-fork on tragus closing meatus	85	4.	95

At the Saturday session the subject of discussion was the

Physics of Sound and Physiology of Hearing.

This was merged with a general discussion on the questionaire on otosclerosis[1] issued by the Otosclerosis Committee of the Section.

Mr. F. C. ORMEROD, the hon. secretary of that committee, said that the committee was now chiefly concerned with the quantitative tests of hearing, using tuning-forks, the voice, the whisper, and mechanical devices. An initial and serious difficulty was the fact that no two tuning-forks, considered to be similar, behaved in the same way; different makes of fork gave different rates of decay of the vibrations. This necessitated getting into touch with the makers of tuning-forks; a series of meetings were held in London, and a good deal of work was done at Sheffield on the matter. Forks were now being made which would accord with the requirements enunciated in the first part of the report—namely, that the half-intensity period should be not less than three seconds and not greater than ten seconds. The National Physical Laboratory were not able to help with a formula based upon fork dimensions, their opinion being that the result must be reached by separate experiment. A mathematician in a Sheffield firm had promised to supply shortly tuning-forks which would come within the committee's requirements. Without this standard fork it was not possible to compare properly the results of different observers.

The committee had also gone into the question of audiometers, and a number of German and American machines had been tested. A large electrical firm in this country was working on an audiometer and hoped to turn out a reliable instrument at a reasonable cost. Audiography was also needed, and reliable charts could only be the outcome of reliable forks and audiometers. The work of the committee had extended over a long time because they were constantly encountering fresh difficulties.

Mr. HALL PIKE said that certain facts had recently become known to physiologists with regard to the mechanism of the cochlea—i.e., the phenomenon observed by Weaver and Bray—working in Princeton University. They had been engaged in assessing the impulses in the auditory nerve, working on the lines of Adrian's investigations in this country. They placed one electrode on the exposed auditory nerve, and another on a different part of the body—working with cats—and connected these to an amplifying system with a loud speaker placed in an adjoining room. They then exposed the ear to sounds of various pitches. They found that all the sounds up to 5000 vibrations per second were faithfully reproduced in the loud speaker in the next room. Adrian's work had shown that the impulses in nearly all sensory nerves were more or less the same, and there was no à-priori reason for supposing that the auditory nerve would behave in any other way. Weaver and Bray considered these electrical changes in the nerve to be true nerve impulses, and then criticised the resonance theory and Adrian's work. Adrian had now been over the ground again. He found it was true that if an electrode was placed on the nerve, the effect stated was produced, but in order to get the effect it was not essential to place the electrode on the nerve; a thread electrode could be laid on the cochlea, on the neighbouring bone, and on the external auditory meatus, without touching the nerve, and the same effects ensued. Adrian regarded these—as he called them—electrical variations as due to the microphonic action of the cochlea. That was not incompatible with the existence of vibrations of the basilar membrane, such as the resonance theory implied. The practical point was that attempts to assess the true impulse in the auditory nerve were, in mammals at any rate, unlikely to succeed, since the true impulse would always be swamped by these microphonic impulses.

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[1] This questionaire alludes to five types of case in which otosclerosis might be present, and the questions, 159 in number, are ranged under the following heads: 1. Ætiology: (*a*) heredity, (*b*) puberty and menopause, (*c*) sex, (*d*) pregnancy, (*e*) other conditions. 2. Examination of the patient: (*a*) local, (*b*) general, (*c*) hearing tests. Treatment: (*a*) general treatment, (*b*) local treatment, (*c*) operative treatment. It was decided at this meeting not to include "secondary otosclerosis," and to proceed with the inquiry on the lines indicated.

The effect of the impulses depended on the vitality of the cochlea; if the circulation to that organ was shut off, or if the auditory nerve was cut, the impulses ceased. This phenomenon was regarded by Adrian as due to the concomitant destruction of the blood-supply. Otologists were looking for a graphic way of representing what the ear was doing.

Sir JAMES DUNDAS-GRANT thought one important point was the difference of action of the nerve when alive and when dead.

Mr. GRAHAM BROWN said the whole auditory apparatus approximated to a wireless receiver; indeed, an analogy could almost be drawn between a microphone and the cochlea, and the question could be regarded as one of pure physics. Presumably this line of testing would eventually be carried out in man.

Mr. E. WATSON-WILLIAMS related a case in which, during a radical mastoid operation, when granulations were being picked out, the stapes was discharged with a little fluid. Two days later the patient had slight nystagmus when turning her eyes to the side opposite to the operation, but at that time there was no vestibular disturbance. She had, however, all the tuning-fork symptoms of ear deafness, and the Weber response was referred to the operated ear—i.e., she had no nerve deafness, though her labyrinth had been opened.

THE ORGAN OF CORTI.

Referring to otosclerosis, he said the terms generally used in discussing deafness were misleading. Too commonly, mention was made of inner-ear deafness without stating whether a lesion of the scala tympani or of the organ of Corti was meant. The true line of distinction between one type of deafness and the other was the organ of Corti itself. If there was no actual damage to the organ of Corti, the deafness was a conduction deafness; and it helped matters considerably if otologists drew the line of deafness not between middle ear and inner ear, but between ear deafness and nerve deafness.

The PRESIDENT said that the scala tympani and the scala vestibuli must be considered as the conducting medium. At one time there was a dictum at the Vienna school that if the stapes were displaced the fatal result was so certain that it was right to do a vestibulotomy, but Mr. Watson-Williams's case showed that this was not always necessary.

Sir JAMES DUNDAS-GRANT reminded the meeting of a paper he read some years ago showing a method of audiometry by tuning-forks, correcting the time error by a logarithmic scale, and reducing it to true loss of hearing power. That, however, accounted only for duration, not for the dying away of the vibrations. In discussing the physiology of the ear, he thought too little attention was paid to the importance of the fenestra rotunda; in his opinion this was the way by which high-pitched tones reached the labyrinth. The tones impinged where they were most likely to stimulate the basal fibres. For the transmission of deep tones he thought the tympanic mechanism was best suited.

SECTION OF UROLOGY.

AT a meeting of this section held on June 25th, the chair was taken by the President, Mr. S. G. MACDONALD, and Mr. OGIER WARD opened a discussion on the treatment of

Inoperable Carcinoma of the Bladder.

He said that the word "inoperable" was commonly used to describe cases which could not be cured by surgical removal of a growth—usually cases with wide extensions or secondary deposits, or in patients too weak for radical procedures. The chances of cure in cancer of the bladder were particularly difficult to estimate, and an exploratory examination was not generally useful; the decision had to rest on cystoscopy and bimanual examination. Fortunately the determination was not of the same importance in cancer of the bladder as in cancer of many other organs, because operative excision of the primary growth in squamous-celled, ulcerative, and nodular infiltrating types was the best treatment if it was at all possible, whether it cured or not. Therefore "inoperable" as applied to bladder growths meant only those which were fixed. Provided the cystoscope revealed any useful margin of healthful mucosa round the neoplasm, and provided the patient was fit, excision was useful for relief if for nothing else. Under this definition radium would obviously only be used in cases where there were considerable indeterminate extensions, and cure was very unlikely. Only too often radium produced large, chronic ulcers accompanied by severe cystitis. Radium might, however, arrest hæmorrhage and reduce suffering if the urine were kept sharply acid. Mr. Ward had treated 43 cases by radium between 1927 and the end of 1930; 15 of these had been treated by radium and open operation and 12 were dead. A further 11 did not live more than 12 months, but 3 had benefited to some extent.

RADON SEEDS.

The radon seed method, though of limited application and manifest imperfections, had some practical value. A flushing cystoscope must first be used, and the seeds could be inserted through the cystoscope, which afforded very accurate control of their deposition. Misplaced seeds were usually voided within 48 hours. Mr. Ward had used this method in eight cases which were beyond all possibility of excision; three had benefited, and one even appeared to be cured. The seeds were 6·0 by 1·1 mm. in size; their average strength was 1·3 to 1·7 millicuries, and 10 or 12 seeds on an average could be implanted at a time. Usually Mr. Ward did not combine diathermy with radium, though sometimes diathermy was used to destroy a cauliflower type of growth or to reduce hæmorrhage. Of nine cases of villous carcinoma treated with radon seeds, seven had had previous diathermy and five appeared to be cured. Two cases of "bald" carcinoma had been treated with seeds and in one the treatment had been at any rate temporarily successful. Nine cases of papilloma had been treated with seeds and cure appeared to be possible in four of them. Two more had undoubtedly benefited. Diathermy had proved of great value in these cases. These methods had the advantage that it was not necessary to open the bladder. Cystotomy was only useful to prevent attacks of clot retention.

SECTION OF NERVE TRACTS.

The terribly severe pain might be relieved by nerve section; the simplest method was the operation practised by G. Cotte of Lyons—the division of the presacral nerves on the fifth lumbar vertebra. Mr. Ward quoted a case he had seen at Prof. von Lichtenberg's clinic in which constant pain radiating down both sciatic nerves in an advanced infiltrating case of prostatic carcinoma had been entirely relieved by this operation. Mr. Ward had performed the operation three times during the last month. Any difficulty encountered was chiefly due to extraperitoneal fat or to the proximity of the inferior mesenteric vessels. All three patients had been considerably relieved. Pain could also be mitigated by chordotomy; laminectomy over the ninth dorsal segment and division of the antero-lateral tracts along a Stebbing's director. This operation was more severe, but its effect was certain.

Mr. **Kenneth Walker** said that inoperable carcinoma of the bladder presented a very difficult problem. Any measure of relief must be adopted to mitigate the frightful suffering. In his hands radium needles had had deplorable results; it was not easy to keep the urine acid, and ulceration with incrustation made the patient's remaining weeks worse than they would otherwise be. Division of the sacral nerves was a method worth pursuing. He had seen chordotomy give immediate relief to excruciating and intractable pain, but it was a separate procedure; what was needed was some method that could be carried out forthwith, as soon as the bladder surgeon found an inoperable growth. Presacral nerve section could not be as certain in its results as chordotomy, for in some cases the pain might be due to extensions. Presumably nerve section would be suitable for cases where the pain was associated with micturition only and was not continuous.

IMPLANTATION OF THE URETERS.

Mr. **Frank Kidd** thought that the pain was more often due to spasm of the bladder wall than to direct pressure, and that presacral division probably acted by relieving tension. In his opinion real progress would be made along the lines of speedy implantation of the ureters into the rectum with total extirpation of the bladder. This relieved pain more satisfactorily than any other method and each step alone was not very dangerous, though the procedure was extremely risky if both steps were performed at one sitting.

Mr. **Cyril Nitch** said that he had transplanted the ureters in 14 patients, seven of them cases of inoperable malignant growth of the bladder. All these seven had died, and all the non-malignant cases had recovered. The objection to the procedure was that in almost all carcinoma cases one or both ureters were thickened; the periureteral lymphatics were presumably infected and very likely the kidneys as well. He concluded, therefore, that transplantation of the ureters was practically hopeless at the present day for severe cases, though in milder cases it might be useful in order to afford relief when no other procedure was justifiable.

TWO TYPES OF GROWTH.

Mr. E. W. **Riches** recognised two main types of growth: the epitheliomatous ulcer and the more common hypertrophic—papillary or nodular—formation. The former gave rise to earlier metastases, while the latter might long remain a local growth. The prognosis and treatment were different in the two types. For the papillary type the best treatment was local excision by a cutting current followed by regular and persistent diathermy per urethram; this type was also perhaps more amenable to radium. The repeat treatments should be carried out under general anæsthesia every few months, and in many cases the growth could be kept under control. Radium inserted from inside the bladder had invariably caused a large slough in his cases, but had nevertheless given relief. Deep X ray therapy had not been successful but might be of value where there was lymphatic involvement. Permanent cystotomy did not give relief. The patient was given a better chance if the bladder were opened, because large masses of papilloma might be removed and also because the cystoscopic diagnosis of inoperability was so uncertain.

Mr. J. P. **Ross** thought that presacral nerve division was better than chordotomy because it would relieve pain without interfering with sensation in the lower part of the body. Though chordotomy was more certain, it should be reserved for a final measure.

DIATHERMY.

Mr. **Jocelyn Swan** believed that the surgeon could do much more for the papillary type of growth by extensive diathermy through a suprapubic opening than with radium. Astonishingly good results were obtained in the relief of pain. He had reserved radium for epitheliomatous growths, but had not obtained very satisfactory results. In his earlier cases he had perhaps used too heavy doses, and the result had been extensive sloughing which had greatly increased the patient's suffering. Radon seeds might be useful for growths which were inoperable by reason of position rather than of size. He preferred to insert them suprapubically, as the open incision allowed more even deposition than cystoscopic insertion. Transplantation of the ureters had in his hands given marked relief, but the great fallacy in this procedure was that in inoperable carcinoma of the bladder one or both kidneys were nearly always infected. Permanent suprapubic drainage and deep X ray therapy had given no relief at all, and so far the radium bomb had not proved any better. Glandular spread did not respond to radium. In his opinion, hope for these cases lay in diathermy for the papillary form and small doses of radium, inserted suprapubically, for the epitheliomatous form.

REPLY.

Mr. **Ward**, in reply, emphasised again the striking case he had seen in Prof. von Lichtenberg's clinic in which bilateral sciatic pain had been relieved by presacral nerve division, and urged that this procedure was worth trying for all types of pain and not only for irritable bladder.

NATIONAL ASSOCIATION FOR THE PREVENTION OF TUBERCULOSIS.

CONFERENCE AT MARGATE, JUNE 25TH–27TH.

THE seventeenth annual conference of the Association opened with a discussion on the

Protection of the Child from Tuberculosis,

the introductory address being given by Sir ROBERT PHILIP (Edinburgh), who urged the routine and systematic use of tuberculin to determine at the earliest possible moment the occurrence of tuberculous infection in the child. The test, repeated at intervals, was harmless and painless, while the knowledge obtained from it was priceless. As soon as a positive reaction appeared for the first time, nothing need be done while the child's health was maintained; but any failure of health would call for careful watching and the adoption of suitable measures. Only a minority of reactors would require individual treatment because of obvious disease, but since it was not easy to single out those who would develop disease, the knowledge afforded by a positive reaction at a given date would prove of supreme service in the interpretation of untoward symptoms and the adoption of suitable precautions. Sir Robert urged a closer coöperation between the department of maternity and child welfare and that of tuberculosis in relation to this problem of tuberculisation. If, he said, serious tuberculous illness of all kinds could be arrested under a simple sanatorium régime, it was no less possible, and was better policy, to stop the progress towards gross disease by ensuring that every nursery, every home, and every school should be run on the same physiological principles which formed the basis of sanatorium life.

Dr. EUGENE L. OPIE (Phipps Institute, Philadelphia) who followed dealt with the

VARYING MANIFESTATIONS

of tuberculosis at successive periods of childhood. A better understanding of the pathogenesis of tuberculosis and improved methods of recognising it had in recent years, he said, made three kinds of investigation notably profitable: (1) the search for tuberculosis in those who were apparently in good health (latent tuberculosis); (2) observation of the various forms of tuberculosis discoverable both in the sick and in the well, carried on over a period long enough to determine their ultimate outcome; and (3) reconsideration of factors involved in the transmission of the disease. Although the tuberculin test determined the presence or absence of tuberculous infection, the intensity of the reaction gave no widely applicable information as to the severity of the infection. Radiological examination defined with a fair degree of precision the anatomical characters, and measured the extent of the graver tuberculous lesions. Tuberculosis that had already undermined health and was recognisable by physical examination or by the discovery of tubercle bacilli in the sputum had by that time almost invariably produced advanced destructive changes in the lung. The examination of children living in contact with tuberculosis and the routine examination of school-children, had shown that grave pulmonary lesions could be discovered at a much earlier stage. The first of these two simple procedures had disclosed latent tuberculosis with such frequency that it was possible to follow up a considerable variety of lesions from their earliest stages until they developed into disease endangering life, or healed with the formation of fibrous or partially calcified scars.

The examination of school-children by means appropriate for the recognition of tuberculous infection offered, said Dr. Opie, the opportunity of measuring its frequency and severity in those who were believed to be in good health. Until the examination of presumably healthy children had been more widely applied, and those in whom lesions had been discovered had been observed through a period of years extending into early adult life, there could be no exact knowledge of their ultimate fate. Although most of the tuberculous infections of children as recalled by the tuberculin test produced focal lesions of lungs and lymph glands that became healed and calcified and caused no impairment of health, radiological examination of children well enough to attend school and of healthy children exposed to tuberculosis in their families had demonstrated the frequent occurrence of extensive infiltrating lesions of the lung parenchyma which, as subsequent observation showed, not infrequently developed into serious disease. Massive caseation of tracheo-bronchial lymph glands was recognisable only when well-defined, rounded, or oval masses could be seen in films at the hilum of the lung or on one side of the trachea. Such glands were of grave danger to life, especially in infancy and early childhood. With tuberculous infiltration of the childhood type there was diffuse opacity in X ray films, indicating tuberculous infiltration in some part of the lung field other than the apex. In one-third of the school-children in whom it was detected it was accompanied by inconspicuous symptoms and physical signs, and might be looked upon as clinically manifest, even though the children were believed to be well.

The adult type of pulmonary tuberculosis made its appearance during adolescence, and was, Dr. Opie said, a more serious lesion than the childhood type in younger children, being the precursor of much of the tuberculosis of early adult life.

Dr. LETITIA FAIRFIELD (County of London) dealt with the

Administrative Outlook

of tuberculosis in children under 16. The special difficulties of the public health officer in dealing with tuberculosis were, she said, partly due to the fact that it was both an overt disease of infancy and childhood causing death and disablement, and also a latent disease of childhood causing death and disablement only when adult life was reached. Administrative measures for infants and children up to the age of 5 years included mainly, provisions for the purity of the milk-supply, the protection of the infant from family infection, and the artificial immunisation of infants. The last of these, however, was not yet a practical proposition for English public health authorities in the light of present administrative experience. The general care and protection of the 2 to 5 age-group was admittedly a weak spot in public health administration. It affected the tuberculous child from the point of view of early detection of overt disease, heightening of resistance levels by attention to general health, and observation after the debilitating effects of the exanthemata. The difficulty was mainly a financial one, but the heavy "death and damage" rate of common ailments during these years should, the speaker thought, justify the expenditure of public money. The school period 5–15 showed a marked diminution of both pulmonary and non-pulmonary forms. Three important points were: (*a*) the necessity for more intensive and scientific research into the so-called "pre-tuberculous" group to disentangle those genuinely infected with tuberculosis from other similar physical types; (*b*) the value of energetic examination of contacts; (*c*) the coöperation of the tuberculosis service with school doctors. The necessity for vocational education should not be overlooked, in view of the importance of keeping children with arrested tuberculosis out of unsuitable trades or unskilled labour, where they would inevitably break down. Dr. Fairfield spoke of the probable value of raising the school age in enabling children to face the strain of industrial life in better conditions and in closing up the present gap in supervision between the school-leaving age of 14 and insurance at 16.

Protection at Various Ages.

Dr. **Reginald C. Jewesbury** considered the protection of the child from tuberculosis

AT BIRTH AND DURING EARLY YEARS.

Non-pulmonary tuberculosis was, he said, a common disease in the child, due to infection either by the humane or bovine type of bacillus. From the age of 1 to 5 years the tuberculous infection tended to attack the mesenteric and abdominal glands, the bones and joints, and the meninges. From 5 to 15 years it tended to attack chiefly the bronchial and mesenteric glands. Pulmonary tuberculosis in young children was rare, but when present it was serious. Infection from the bovine tubercle bacillus was definitely a preventable disease. Pasteurising or, better still, boiling the milk would make it safe for the child. In cases of infection from the human tubercle bacillus in the home, the risk could be minimised by careful training of the consumptive member of the family in the necessary hygienic precautions, the removal of an active and infectious case to a residential tuberculosis institution or proper isolation and nursing in the home or elsewhere, or, finally, by the removal of the child from the tuberculous home. Prophylactic vaccination by B C G had been applied in all European countries except England, Austria, and Portugal, but its use as an immunising agent, particularly for young children, could not be advocated until it could be shown to be free from virulence under all conditions and that it produced an effective immunity.

DURING PRE-SCHOOL YEARS.

Prof. **S. Lyle Cummins** (Cardiff) described the main problem as that of detecting the existence of active, though larval, tuberculosis, especially in the tracheobronchial lymphatic glands or in the form of early focal lesions of the lung tissue. Children harbouring lesions of this kind might, he said, appear to be in excellent health. There were two main aids to diagnosis: X ray examination and tuberculin tests. How to bring these tests to bear in a practical and economic way upon the children in infected homes was yet unsolved. Search should be made for new methods of detecting activity in latent or larval tuberculosis; such methods might be found, he said, in the application to young children of certain types of blood examination. Much more information was required as to the exact significance of tuberculin tests during the pre-school period of life, and arrangements should be made for the careful following-up of tested children during the subsequent years.

Dr. **T. R. Elliott** (Salop) suggested that the two chief requirements—(1) prevention of infection; (2) increasing individual resistance—could best be met by education in healthy living, in food values, and in the special food requirements of growing children, by better housing in general, and of infectious cases in particular, and by a more general use of open-air shelters for contacts; by occasional boarding-out of threatened children, and by the segregation of advanced cases. He outlined a scheme started in Shropshire in 1925 by which a pregnant woman suffering from pulmonary tuberculosis was sent to a sanatorium until her confinement was due, when she entered a nursing institution. As soon as the baby was born it was sent to a country home for ailing babies, where it was kept for 12 months under open-air conditions. Up to the present, none of the 33 babies thus dealt with had developed tuberculosis.

DURING SCHOOL AGE.

Dr. **R. H. Crowley** (Board of Education) said that although statistics had revealed the relative unimportance of the incidence of pulmonary tuberculosis at this stage of life, compared with earlier and later, yet even during the school period it was by no means negligible as a cause either of death or of disabling disease. In 1929 the death-rate in England and Wales from all forms of tuberculosis was 300 between 5 and 10 years, and 330 between 10 and 15 years, per million living; and the number of tuberculous children of school age in England and Wales on Dec. 31st, 1930, returned by school medical officers was 24,077. It was, he said, of primary importance to understand the significance of so-called latent tuberculosis, especially during early and mid-adolescence. Opie and others had made it probable that incipient tuberculosis of early adult life was advanced latent tuberculosis of adolescence. The surest method of protecting the child of school age was to remove a likely source of infection, or, failing that, to dilute it. Resistance to disease might be increased by providing midday meals, opportunity for rest, especially in the case of younger children, and facilities for playing and bathing. From the administrative point of view what was required was a medical service in the home linking up with the infant welfare and the school medical services.

Dr. **H. Midgley Turner** (Sheffield) said the main obstacle in the protection of children against serious tuberculous disease was the failure to realise that while sputum-positive pulmonary tuberculosis was rare among children, early pulmonary tuberculosis in the non-infectious stage was of frequent occurrence. There were sound reasons for believing that about half the serious tuberculous disease in young adult life owed its origin to childhood infection.

Dr. **L. S. T. Burrell** (London) said he doubted whether small infections acquired naturally gave real protection to the individual, and although experiments on the lines of immunisation were to be encouraged, he thought that endeavours to stamp out tuberculosis should centre round general hygiene. Any steps which were effective in making the individual more contented and free from worry, able to obtain good food, and to live under hygienic conditions, tended to stamp out tuberculosis.

EDINBURGH OBSTETRICAL SOCIETY.

Ureteric Lesions Causing Abdominal Pain.

A meeting of this society was held on June 10th with the President, Dr. **H. S. Davidson**, in the chair.

Dr. **Duncan M. Morison** read a paper on Ureteric

Lesions as a Cause of Abdominal Lesions: A Consideration of "Ureteritis" or "Ureteral Stricture"—a condition which had only been recognised comparatively recently as a clinical entity. The pathology was still obscure. As proved by corrective treatment many cases of apparently obscure abdominal pain were due to ureteric lesions. The zones of the ureter most frequently affected were the nodes or physiological sites of narrowing—i.e., (*a*) pelvo-ureteral junction, (*b*) where the ureter crossed the iliac vessels, (*c*) transvesical portion, (*d*) in women, where the ureter was associated with the broad ligament. Two types could be differentiated, congenital and acquired. The congenital type, due to some developmental error, was frequently characterised by a simple localised narrowing without any intramural thickening. The acquired form was apparently secondary to some primary focus of infection, such as tonsils, teeth, prostate, or cervix. It might also be induced by certain forms of repeated severe physical exertion—i.e., hammer throwing. The earlier phases of a ureteritis were associated with local hyperæsthesia of the overlying mucosa, any stimulus of which readily produced ureteral spasm. The initial stage of the infection did not give rise to any appreciable reduction of the ureteral lumen, but later, as intramural changes became more evident, localised zones of narrowing occurred at the sites affected. The intermittent attacks of spasm, and the more continuous impairment of the ureteral lumen, led to an increasing interference with urine conduction and the formation of stasis within the renal pelvis. Apart from the discomfort there was thus a progressive hindrance to renal elimination. As a general rule, low ureteritis would take longer to affect renal damage than would one situated at the pelvo-ureteral junction. The lumen of the ureter at the affected site rarely showed very marked reduction; hence the term ureteral stricture commonly applied was inaccurate except in a few instances where a definite fibrous stenosis was present. The use of this inappropriate term had led to misunderstanding of what was meant by this condition.

SYMPTOMATOLOGY.

The patient usually had a mild degree of toxæmia with lassitude, loss of mental acumen, headaches, nervousness, and irritability.

Local symptoms were attacks of vague pain in either kidney angle, or laterally below the costal margin, attended with nausea or sickness. It was probable that, in the presence of a ureteritis of the pelvo-ureteral junction, occasionally a dull ache was felt just below and lateral to the umbilicus. When the lesion was at the pelvic brim pains were referred to the inguinal region. Groin pains without bladder symptoms would point to a broad ligament source, while a suprapubic ache associated with attacks of urinary frequency usually indicated involvement of the ureter at or near its transvesical portion. If, as frequently occurred, a patient had more than one portion of the ureter affected, there was a corresponding grouping of these symptoms. The attacks of pain were commonly described as dull, persistent, and aching in character, frequently likened to a toothache. They might last from one to several hours. The pain was gradual in onset, reached a considerable degree of intensity then slowly subsided. At the period of intensity or most marked ureteral spasm there was very commonly a sense of renal discomfort indicating a damming back of urine on the renal pelvis. The pain was not induced by exercise, but fatigue or excessive exertion tended to bring it on. Patients frequently complained that they were awakened in the early hours of the morning with the pain, and that relief was only obtained by rising and walking about for a short time. It might be inferred from this that in the recumbent position the ureter was relatively more extended, and that the slight tension irritated the localised inflammatory area within the ureteral wall. There might be intermissions from pain for days, weeks, or months. Since a ureteritis favoured the formation of stasis in the higher urinary tract, chronic or relapsing pyelitis and calculus formation might occur as secondary conditions. It was essential that the primary contributing factor should not be overlooked.

DIAGNOSIS AND TREATMENT.

Since the symptoms might closely simulate those of the chronic appendix and disease in the pelvic organs, differential diagnosis was not easy. The absence of bladder symptoms in all but the transvesical lesion, together with a negative urine, tended to discount the possibility of any pathological condition of the urinary tract. A cystoscopic examination would fail to detect the lesion if ordinary straight ureteral catheters were employed unless the degree of ureteritis was sufficiently marked to render a stenosis evident. A positive diagnosis was based on the following findings: (*a*) the presence of residual urine in the renal pelvis; (*b*) calibration of the ureter by a "bulbed" bougie, noting mechanical resistance to the passage of the bulb or "hang" on its withdrawal, and the local induction of pain, and its character; (*c*) the presence following instrumentation of a reproduction or an exaggeration of the pain previously complained of.

Varying amounts of residual urine were to be found in the renal pelvis in cases of long standing or established ureteritis, but in the more recent types where ureteral drainage was still adequate there was usually none. In the earlier stages accordingly reliance had to be placed on calibration. By the employment of "bulbed" bougies the entire length of a ureter could be readily palpated and any altered zone detected. By a mechanical sense of touch combined with the statement of the patient regarding the site and character of pain produced, the location and type of a ureteritis might be determined. In doubtful cases, if the pain produced during or following the examination was not similar in character and location to the previously experienced pain, the ureter might be dismissed as a possible factor.

Treatment consisted in a course of progressive ureteral dilatation till a size of "bulb" bougie No. F.12 could be easily tolerated. By this means the attacks of pain were alleviated and, since better ureteral drainage was achieved, there was a corresponding removal of stasis within the renal pelvis with consequent benefit to general health.

Dr. J. R. CAMERON read a paper on Intracranial Injuries in the New-born, and their relations to Breech Delivery. He showed six dissected specimens of skulls from infants who had died either at or soon after breech delivery from intracranial injury. He described in detail the birth record of these cases, and suggested an association between the clinical management and the intracranial damage. The various anatomical factors involved in the production of these injuries was discussed.

Dr. W. P. KENNEDY gave records of a case of Streptococcal Infection of the Uterus Complicating Pregnancy.

REVIEWS AND NOTICES OF BOOKS

Pathology of Internal Diseases.

By WILLIAM BOYD, M.D., M.R.C.P. Edin., Dipl. Psych., F.R.C.S., Professor of Pathology in the University of Manitoba; Pathologist to the Winnipeg General Hospital. London: Henry Kimpton. 1931. Pp. 888. 45*s.*

THIS work is designed as a companion volume to Prof. Boyd's text-book of Surgical Pathology, published in 1925, and we predict for it an even greater success. There is need at present for a text-book of pathology suitable for the average physician. Many of those in general use are too large and too specialised to make an appeal outside the world of pathologists with the result that the physician tends to seek pathological information in the text-book of medicine. With this want in mind Prof. Boyd has endeavoured, with singular success, to act the part of the clinical teacher as well as the teacher of pathology, and to produce a book which will be suitable for the practising doctor and for those entering for higher examinations in medicine. His work deals with the special pathology of those diseases which are to be found in the medical wards of a general hospital. In order to avoid overlapping with his text-book of Surgical Pathology, the author has selected and pruned his material in such a way that certain matter which would find a place in a systematic text-book has been omitted. The omissions are of no great importance, however, and the book is comprehensive enough for practical purposes. Prof. Boyd takes the view that the chief purpose of pathology is to aid the physician in his work, and he discusses all problems in the light in which they occur to the clinician, making a special point of correlating the symptoms with the morbid anatomy of the disease. In order also to make the book as self-contained as possible, he has prefaced most of the sections with brief introductory notes on the anatomy, histology, and pathological physiology of the organ concerned. The reader whose activities have been remote from a medical school will have no difficulty in linking up the teaching in this work with his background of pathological knowledge. Much space is given to discussions of research and recent advances in pathology, and a useful list of references is appended to each section.

Prof. Boyd is not only a teacher possessing individuality and force but he is a writer of ability. He opens his work with the following words: "Of all the ailments which may blow out life's little candle, heart disease is the chief." Having stepped on this literary tight-rope he deftly maintains his poise to the last page. Since his book is not only readable but sound and up to date and clear, it should be popular with physicians and to those pathologists who retain some interest in clinical medicine.

Uber Physiologische Grundlagen bei der Ernährung Tuberkulöser.

By Prof. Dr. A. DURIG, Vorstand des Physiologischen Institutes in Wien. Vienna: Moritz Perles. Pp. 80. M.3.20.

Prof. Durig has written an interesting monograph dealing with the various aspects of metabolism and diet in relation to tuberculosis and has brought together a good deal of material which is not to be found in ordinary text-books. Beginning with mortality statistics of the war, when food conditions in all countries had an adverse effect on tuberculosis, especially in Central Europe, and continuing with the Charlottenburg figures on real wages and tuberculosis, the writer examines the many factors, anatomical, physiological, psychological, and pathological, which enter into this problem of metabolism and tuberculosis. Obviously, mere increase in adiposity does not necessarily add to the powers of natural resistance to tuberculous infection, and the time has gone by when doctors stuffed their patient ad nauseam. Account has to be taken of many factors not recognised by a previous generation of physicians. Prof. Durig includes in his survey most of these modern questions, such as the use of insulin, the vitamins, and the Gerson diet which has been so extensively tried out in Germany. A place is given also to more academic physiological topics, such as Pavlov's conditioned reflexes. The book is happily free from those long tables of caloric values of foods and the diagrams of intake and output which generally complicate this type of book; but it lacks also—and this we deplore—both a subject index and a bibliography, two very valuable adjuncts to a monograph which covers so many views and schools of thought. The use of chapter and sectional headings would also add to the convenience of the reader.

Organic Chemistry.

For Medical, Intermediate Science and Pharmaceutical Students. Second edition. By A. KILLEN MACBETH, M.A., D.Sc., F.I.C., Professor of Chemistry, Adelaide University. London: Longmans, Green and Co. 1931. Pp. 296. 6*s.* 8*d.*

THIS little book is intended to present the fundamental aspects of organic chemistry to the student in such a way that he may be encouraged to think more and memorise less; a very laudable object which the author's mode of presentation should go far to achieve. The difficulty encountered by the student on commencing organic chemistry is, in part, due to his inability to visualise the configuration of organic compounds; to overcome this difficulty the subject of configuration has been introduced at an earlier stage than is usual in many other text-books of this type, and there is much to be said for this arrangement. A further feature of the book is the attention paid to the more recent practical developments of applied organic chemistry such as the production of oil from coal, power alcohol, and synthetic methyl alcohol—to mention but a few examples. Such treatment of the subject is calculated to stimulate the imagination of the student and the book forms a good introduction to organic chemistry.

Creative Mind.

By C. SPEARMAN, Ph.D., Hon. LL.D., F.R.S., Foreign Member Société Française de Psychologie, Professor of Psychology at the University of London. London: Nisbet and Co., Ltd. 1930. Pp. 125. 5*s.*

Prof. Spearman has added considerably to the scientific development of psychology. Without his theoretical speculations, based upon many years of experimental and statistical research, experimental psychology as applied to education in particular would not stand where it does to-day. The mathematical psychology of correlation, coefficients, and tetrad difference may seem arid and disquieting topics, but in this book of singular charm and cultural breadth Prof. Spearman has extended his theory of cognition to the field of creative effort in art and scientific discovery. This theory of cognition is based upon the three laws of noegenesis, which state first that a person tends to know his own sensations, feelings, and strivings—a principle of apprehension; secondly, that "when two or more items are given, a person may perceive them to be in various ways related"; thirdly, "when an item and a relation to it are present to mind, then the mind can generate in itself another item so related." The somewhat abstract statements of qualitative and quantitative laws are illuminated by reference to pictorial and plastic art, and without detracting from the artistic merit of works of creative genius the author has certainly not given finality to æsthetic theory, but has established bonds between æsthetics and general psychology. Prof. Spearman always points out how scientific discovery pursues the same mental course as does artistic creativeness, and that everyday behaviour too is bound to these activities by the operation common to all three—the educing of correlates. Many will read these pages with a feeling that artistic creation, discovery, and behaviour need other factors for their explanation than the bare eduction of correlates, but no one will close the book without having had the experience of contact with a singularly penetrating intelligence.

Handbook of Protozoology.

By RICHARD ROKSABRO KUDO, D.Sc., Assistant Professor of Zoology, University of Illinois. London: Baillière, Tindall and Cox. 1931. Pp. 451. 25s.

UNLIKE other books on protozoology which have been published in recent years, this one deals very largely with free-living protozoa which numerically are a much larger group than parasitic forms. The parasitic protozoa are given only their fair share of the book without any special reference to their pathological importance. Thus the account of the hæmosporidia, including malarial parasites of man and animals and the piroplasmata, fills six pages, while the parasitic amœbæ and the trypanosomes and their allies are dealt with in 12 and 10 pages respectively. The book therefore is designed more for those who wish to study the protozoa as a group from the general zoological standpoint than for the parasitologist who requires detailed information about disease-producing forms. After a short introductory section follows an outline of classification indexed for reference to the succeeding systematic section which forms the bulk of the book. In this section each group is introduced by a short description, while definitions of orders, families, and genera follow with a brief mention of some of the more important species. Most of the text figures, and these are numerous, depict several organisms, in some cases a dozen or more, so that there is a wealth of illustration which greatly enhances the value of the book. The classification followed is the conventional one, the phylum protozoa being divided into two sub-phyla, plasmodroma and ciliophora, the former including the three classes mastigophora, sarcodina, and sporozoa, and the latter the two classes ciliata and suctoria. The subdivision of these classes agrees in the main with that found in other text-books. Of special interest are the sections devoted to the myxosporidia and the microsporidia, on both of which groups the author is a recognised authority.

The book will be of value not only to the zoologist, but also as a work of reference to medical men and parasitologists who in their dealings with pathogenic species are liable to encounter many non-parasitic forms. It may save them from many errors and will give them a picture of the protozoa as a whole in which the pathogenic forms appear in their true perspective. Prof. Kudo has produced an attractive handbook.

REPORTS AND ANALYSES

ENERGEN FOOD PRODUCTS.

(ENERGEN FOODS CO., LTD., ENERGEN WORKS, WILLESDEN.)

WE have received for examination a number of food materials prepared by this well-known firm. The underlying idea of all of them is to reduce the starch content and to raise the amount of assimilable protein or gluten. In this respect they will serve a useful purpose to those physicians who are concerned in prescribing diets to patients whose carbohydrate tolerance is low. For purposes of comparison the results are given in tabular form.

—	Nutrient pastry flour, rich in gluten.	Macaroni enriched with gluten.	Digestive biscuits.	Endobran biscuits.	Cocoa.
Price	1 lb. = 10*d.*	12 oz. = 1*s.* 6*d.*	½ lb. = 1*s.*	1 lb. = 3*s.* 6*d.*	Per carton = 1*s.* 3*d.*
Moisture (per cent.)	10·8	10·1	3·9	3·9	5·88
Ash (,,)	1·2	1·12	1·48	2·9	4·96
Fat (,,)	3·02	1·74	25·14	23·9	16·74
Protein (,,)	24·94	31·24	23·89	17·15	36·75
Carbohydrates (per cent.)	60·04	55·80	45·59*	52·15†	35·67
Calorie value (per lb.)	1708	1690	2339	2188	2053

* Containing 0·66 per cent. crude fibre.
† ,, 5·90 ,, ,, ,, ,,

Flour.—As ordinary flour contains 11–12 per cent. of protein and 75 per cent. of carbohydrate it will be evident from the figures above that a considerable amount of gluten has been added. This is, of course, reflected in the low percentage of carbohydrate.

Macaroni.—It is stated that this preparation contains over 30 per cent. of protein, a claim which is upheld by the figure quoted. The carbohydrate (starch) content of ordinary macaroni is about 75 per cent., whereas the amount in the Energen brand is some 19 per cent. lower. This increase of protein accounts for the rather dark colour.

Digestive Biscuits.—It will be noticed that in these biscuits the fat and protein contents are very high, and the carbohydrate correspondingly low. The balance between the three principal constituents is well arranged, and the flavour is not unduly rich.

Endobran Biscuits.—These contain a considerable amount of bran-like material which although not of high nutritive value plays a part as a peristaltic agent.

Cocoa.—Since ordinary good grade cocoa powder contains 24 per cent. of fat and 19 per cent. of protein, it will be apparent that the Energen preparation is enriched with a considerable amount of gluten, the fat content being proportionately low.

All of these foods are well prepared and attractively packed. The figures quoted by the Energen Company for the calorie value of their preparations are slightly lower than those we find.

THE LANCET.

LONDON: SATURDAY, JULY 4, 1931.

EPSOM COLLEGE.

In February last the Council of Epsom College issued a questionaire to the governors of the College with the intention to ascertain a collective view on a proposal, advocated by the Council, to abolish the existing method of electing pensioners, scholars, and annuitants. At the present time the results of these elections are determined by the votes of the whole body of the governors. This method in the early days of the inception of the College worked well, but with the increase (and increasing) size of the constituency it has been felt by many no longer to meet the situation with fairness. The risk was seen to be becoming large that the best candidates would not always meet with success, and among the reasons for this opinion one was paramount, when the selection of the foundation scholars was at issue. The friendless child was at a serious disadvantage, while he might be exactly the child whose benefit was intended by the originators of the Foundation. Further prompt help could not be forthcoming while the expensive procedure of collecting votes was going on.

The questionaire met with a response overwhelmingly in favour of a drastic change of procedure suggested by the Council. Votes were recorded by 3862 governors, being over 90 per cent. of the constituency, in favour of the reforming proposal, while only 318 governors voted against it. Having therefore a verdict of nearly 93 per cent. in favour of the change, the Council decided that, after the annual general meeting of the following June, an extraordinary general meeting should be held to obtain authority for the Council to give effect to the wishes of this large majority. The decision of this meeting is recorded elsewhere, and must have given great pleasure to Dr. Raymond Crawfurd, and the existing Council, who have promoted this vital change for the better in the constitution of the College. The resolution authorising the Council to effect the abolition of the present method of election of pensioners, foundation scholars, and annuitants, by the governors and to substitute a procedure of election by a committee appointed by the Council was passed unanimously, a result which was particularly gratifying because the complete concord of view among the governors made it easier for the legislation, necessitated by the change of constitution, to be obtained without expense to the College. The procedure has been made possible by the sympathetic attitude of the Board of Education and the Charity Commissioners.

The new electing body will contain 10 members of the sitting Council, and 10 governors of the College, not being members of the Council. The exact way in which this personnel should be chosen has not been actually decided, and it is a matter which requires some thought. On the principle of general suffrage every supporter of the Foundation had a potential voice in the choice of the beneficiaries, but the outcome of the elections might not reflect the objects which should be in view. The change in the machinery of election by which a small committee is given the responsibility of the whole constituency must lead to a far surer recognition of individual claims, but it will be necessary that the constituency should feel that their responsibility is being exercised by a representative body. The projected scheme, as outlined by Dr. Crawfurd, should meet the case. Under this scheme the 10 members of the selection committee, selected by the governors from without their own body, will represent different interests in different localities upon a rota system, ensuring that the whole constituency will have, as time passes, the particular opportunity of exercising voice.

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FURTHER REPORTS ON MUSCLE EXTRACTS.

The claims made for the value of extracts of muscle and other tissues in circulatory disorders [1] are being put to further test. U. S. v. Euler and J. A. Gaddum, working at the Medical Research Institute, have studied the depressor and vasodilating action of certain tissue extracts, and the possible nature of such depressor substances. They conclude [2] that at least five different types of such vaso-dilator substances may occur in tissue extracts. These are: (1) histamine, (2) choline and choline esters, (3) substances allied to adenosine, (4) and (5) two hitherto unidentified substances not belonging to any of the first three groups. One such substance which has been called kallikrein is present in urine and pancreas; the other v. Euler and Gaddum have prepared by acid-alcohol extraction from a number of organs such as small intestine, brain, stomach, and bladder. Experimentally it is found that adenosine and its allies slow the heart, whilst kallikrein accelerates it; all these substances appear to lower appreciably the arterial blood pressure in laboratory animals.

Clinical trials of such tissue extracts—"circulation hormones" has been suggested as a name for them—have been extensively carried out on the Continent. A recent questionaire sent by Dr. R. von den Velden to a number of physicians in Germany, Austria, and elsewhere shows [3] a great diversity of opinion as to their therapeutic success. This may be partly owing to the large number of different preparations that have been employed—the most popular being lacarnol prepared from skeletal muscle—and to the different route by which they have been given. The conditions for which these preparations have been principally used have been angina pectoris, high blood pressure, arterio-sclerosis, and peripheral vascular disorders such as Raynaud's disease. It seems legitimate to draw certain tentative conclusions from the results. First, that the action of the various preparations—myotrat, eutonon, myoston, kallikrein, lacarnol, angioxyl, and others—is essentially similar. Secondly, that little or no favourable effect is to be expected from tissue extracts in cases of myocardial weakness or of cardiac irregularity. In spite of a few contrary experiences the great bulk of opinion is that tissue extracts play no part in the treatment of these conditions, and that where digitalis is indicated it should under no circumstances be replaced by these preparations. As regards high blood pressure opinions are very diverse. The majority of clinicians whose opinions are given find little improvement in the subjective complaints. Some record definite lowering of pressure with considerable clinical improvement; others using the same preparation have seen little or no effect. Clearly cases may differ so widely in character and severity as to make comparison difficult. In intermittent claudication there are very favourable reports, as also in some cases of endarteritis obliterans and gangrene of the extremities. In some patients, however, the latter conditions have been made worse by the injections and caution is undoubtedly required in their use in these cases. In coronary disease, and particularly angina pectoris, many speak enthusiastically of these preparations and a favourable influence on them is reported by the majority of writers. Lessening in the severity and frequency of the attacks is the rule, though again a few have noted partial or complete failure. It would seem, however, that occasionally reactions of an unpleasant nature may occur, though more complete purification and removal of protein from the extracts have lessened their frequency.

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[1] See The Lancet, March 7th, p. 533.

[2] Jour. Phys., 1931, lxxii., 74.

[3] Deut. Med. Woch., 1931, lvii., 672.

To sum up, it may be said that these new "circulation hormones" are not entirely without risk, and it is still necessary to urge caution in their dosage and administration. On the other hand, there can be little doubt that in these new organic extracts we have an active therapeutic agent whose precise use and limitation is still to be determined.

PHYSICS: OLD AND NEW.

THE exact sciences have a fascination for the medical man, who humbly accepts the fact, of which he is often reminded, that the biological discipline which he follows is based on less sure foundations. Physics especially attracts his envious attention, since occasionally he is allowed to build, according to his poor capacity, some useful superstructures on the outlying portions of what he believes to be firmly established groundworks. In the past these superstructures were usually carried to a point and then broke down through failure of knowledge on the biological side—as in optics, where the physiological aspects of the mechanism of vision remain obscure. But more recently, in some directions where medical progress depends on a clear conception of physical phenomena this picture has not been forthcoming. For example, clearer differentiation of the physical properties of all kinds of rays emitted in the course of radiotherapeutic measures must precede the acquisition of any exact knowledge of their action on each of human tissues; and the otologists have had to wait long (see the discussion on p. 18) before a standard tuning-fork has been devised.

If one approached in this rather querulous spirit the exhibits displayed on June 23rd by the National Physical Laboratory at Teddington, he could find many targets for quips, but he would be exposing rather his own ignorance of the progress of physics during this century than indicating the claims of the biological sciences to have caught it up. All departments of the laboratory afford examples of the way in which the very methods of applying to practical uses knowledge already gained have suggested other directions in which research must be pursued. This twofold activity characterises nearly all departments of the laboratory and is especially noteworthy, perhaps, in the departments of Aerodynamics and in the William Froude Laboratory. Here the rapid growth of test work connected with ships has necessitated the construction this year of a new tank which, when completed, will measure 678 by 20 feet, being thirty feet longer and ten feet narrower than the Yarrow tank now in use. It is noted that a 30 per cent. reduction in fuel consumption has on occasions resulted from submitting a model of a proposed ship to tests in this laboratory. It is possible, moreover, to determine the force exerted by wind on the deck erections of ships by towing models upside down through water, the erections being attached to a flat-bottomed raft. In this way new arrangements have been designed which reduce the power expended in driving ships against strong winds. Another branch of research in this department is likely to be even more important to shipping. Recent accidents to large vessels on or near a coast have emphasised the need for still further improvements in aids to navigation. One of the most promising methods employed at present is known as the rotating beacon. In this system a continuous transmission is maintained by a shore station, the transmitting aerial rotating uniformly at a speed of one revolution per minute. The transmission from the vertical coil has a narrow beam of silence which rotates with the coil. If the transmission is received on a distant ship, the navigator in the ship can ascertain the bearing or direction of the beacon by measuring the time which elapses between one of the signals and the moment when the beam of silence falls on the ship. An apparatus here exhibited shows how the signal can be received and recorded on a drum which rotates in unison with the beacon, the direction of the beacon from the ship being thus measured automatically. In the Physics department considerable progress is being made in devising convenient ways of measuring sound. On the one hand measurements and analyses are made of the actual energy in the sound waves, and on the other a simple estimate is made of the overall loudness of the noise as heard by the ear. On a convenient scale of loudness with zero at the threshold of hearing, sounds become painful at about 130 "degrees" above threshold, where each degree, known as a decibel, is approximately the least change in loudness perceptible to the ear. The level of conversational speech is at about 50–60 decibels above threshold. Aeroplane cabin noises are at present in the region of 80–110 decibels above the threshold. Eighty decibels correspond to the level of the noise in a tube train. It is almost impossible to converse in a loudness level of 110 decibels, even by shouting. In street traffic and in ordinary trains the noise ranges from 50–70 decibels above threshold, and efforts are being made to reduce noise in aircraft cabins to such a level.

Far indeed is the horizon of physics envisaged by the National Physical Laboratory from the conception imposed by dogmatic chapters on heat, light, sound, electricity, and magnetism in the elementary text-books of the pre-medical course. We all knew well enough when following this course that the ground would grow more difficult if we pursued the path, but most of us gratefully shut the gate at the place where it let us into the more congenial fields of physiology and anatomy, and never reopened it. This was a mistake which future generations will hardly be permitted to make, since biophysics, younger even than biochemistry, promises to be no less important. At least the newer developments of physics have shown the futility of any attempt to distinguish between the more, or less, exact sciences. All our standards are suffering change, even, may be, the most fundamental. Almost the first thing we learnt in elementary physics was the importance of an arbitrary unit of measurement. The standard yard was defined as the distance at 62° F. between two lines on gold studs inserted in a metal rod under the custody of the Board of Trade. Lest this Imperial Standard should be lost through any cause, as was its predecessor by fire, four replicas were embedded in the masonry of, or kept securely in, various national institutions. Now even this standard is found wanting. At the National Physical Laboratory experiments are proceeding with a view to establishing a wave of light as the universal length unit in substitution for the present material standards represented by the Imperial Standard Yard and Prototype Metre. Apart from the advantages of indestructibility and permanence, the proposed unit is said to offer possibilities of increased accuracy in reproduction and measurement. The work so far accomplished indicates that the yard and metre lengths can be reproduced to an accuracy of about four millionths of an inch, and further refinements of the apparatus are likely to increase the accuracy to one millionth of an inch. Our rejoicing at this possibility is tempered by a regretful glance at the school text-book which first familiarised us with this Imperial Yard, which from something that had seemed to be a natural phenomenon in the home even of a dressmaker or a carpenter became suddenly elaborated into a lesson. Those who are loyal to material standards may take comfort from the fact that nearly 40 years ago A. A. Michelson showed that a standard of length might be restored, if necessary, by reference to the measurement of wave-lengths of light, but that the desired degree of accuracy, to a millionth of an inch, has not even yet been, and may never be, achieved.

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THE ORDER OF ST. JOHN.

No surviving institution connects the British Empire of to-day so closely with what we regard as the ages of chivalry as the historic Order of St. John of Jerusalem, the English branch of which last week celebrated with fitting ceremonial the centenary of its revival. The "Grand Priory in the British Realm of the Venerable Order of the Hospital of St. John of Jerusalem" traces its ancestry back to the little hostel for Christian pilgrims created by Brother Gerard which Godfrey de Bouillon found in Jerusalem when he captured the Holy City in 1099. From this small beginning was developed a great Order of Chivalry pledged to defend the Christian faith and to serve the sick and poor which eventually became a military power with all the attributes of Sovereignty until it was so smashed to pieces by Napoleon that on the Continent it survives only as a highly exclusive body of Roman Catholic nobles of sixteen quarterings. For four centuries the Order occupied a splendid place in England with its great central Priory in Clerkenwell, the scanty remains of which now once more house it. At the Dissolution it suffered the fate of all other religious houses and it was not until 1831 that it was resuscitated, and not until 1888 that it was established by Charter as the Order of St. John of Jerusalem in England with Queen Victoria as hereditary Sovereign Head and Patron. How much the Order owes to the Royal Family is suggested by the presence at the centenary service in Westminster Abbey last week of nearly a dozen members of the House of Windsor, with the Duke of Connaught, the Grand Prior, at their head. At that service the Archbishop of Canterbury preached a sermon which was accorded the distinction of being broadcast throughout the world. The Order is associated in the minds of most people chiefly with the work of the St. John Ambulance Association which, starting as a teaching body in 1878, developed a decade later into the St. John Ambulance Brigade. The activities of the Brigade in the war, associated with those of the Red Cross, can never be forgotten, and in peace its 70,000 members of both sexes are almost daily doing invaluable work in street and home here and in the Dominions. Almost half a century ago the Order renewed its immediate connexion with Jerusalem by opening the Ophthalmic Hospital on "an impressive site overlooking the Temple" (to use the Primate's words), and here works of mercy are freely extended to men and women of all races and beliefs.

Manchester Babies' Hospital: Annual Report. In 1930 this hospital, which was founded 17 years ago by women doctors and was originally staffed entirely by women, and admits patients ranging in age from a few hours to two years and a half, had 604 in-patients and 088 out-patients, an increase from 406 in the preceding year, and a growth in attendances from 1325 to 2013. Of the in-patients, whose average stay was 53 days, 90 died, the most frequent causes of death being prematurity (29) and broncho-pneumonia (18). The after-care work ensures that the majority of ex-patients are kept in view.

ANNOTATIONS

OFF-DUTY WORK.

AN interesting recommendation was made last week by the central public health committee of the London County Council for the council's acceptance. It has long been the practice in the mental hospitals under the council's control to allow the medical superintendent to hold an appointment unconnected with his office, on such conditions as the council may decide proper. He may, for instance, be physician to an out-patient clinic at a general hospital, and in fact has often been such. Application has now been made for this permission to be extended to medical officers of other types of hospital which have more recently come under the council's control. The deputy medical superintendent of Fulham Hospital has the opportunity of becoming assistant radiologist at the National Hospital, Queen-square; the assistant medical officer at St. Mary (Islington) Hospital would like to apply for the appointment of honorary medical registrar at the Maida Vale Hospital for Nervous Diseases. On his behalf it was stated that the appointment, which would involve attendance on two or three afternoons a week, would be carried out during normal off-duty hours. The committee's recommendation was made in no grudging way. "We are of opinion," they say, "that the staff generally should be encouraged to hold such appointments, as association with outside medical work provides valuable experience which will be of benefit in carrying out their duties under the council"; and the grant of similar facilities is to be customary provided that (1) the appointment is an honorary one, (2) the holding of it shall not interfere with the efficient discharge of the officer's ordinary duties, and (3) the work is done in off-duty hours. The position is interesting, for the question of the employment of off-duty hours in a full-time appointment has provided many conundrums, some of them so difficult of solution as to require the aid of medical defence societies. Broadly speaking, the employer of a medical person cannot prescribe or prohibit any form of unpaid off-duty employment which does not contravene his or her terms of service, and, unless it is expressly stipulated in these terms that no other moneys whatever shall be received by the officer in virtue of his medical qualification, it is difficult to see how the prohibition of payment can be enforced. Where the whole-time salary is on a generous basis, the question of supplementing it will hardly arise, but this is not always the case. The arrangement suggested in London, if it should become general, will result in a liaison between the voluntary and municipal hospitals which must have its effect on the future of both. A possible risk of widespread response to this permission might be to endanger the practice of offering modest honorariums for hospital posts, such as registrarships, to enable young men or women to keep themselves by doing useful routine work while waiting for a vacancy on the staff.

DIATHERMY AS PYREXIAL AGENT IN G.P.I.

SINCE first Wagner-Jauregg brought hope to the black prognosis of general paralysis of the insane, experimentation has been mainly concerned with various ways of producing fever. The essential element in the cures that have been attained has seemed to be the pyrexia induced by the remedial agent, and on the whole the opinion of psychiatrists still agrees with that of the pioneer workers in regarding the plasmodium of malaria as the best agent. But to give a man malaria is a serious responsibility, and could only be justified by the appalling future before these patients in the absence of treatment and the very considerable measure of control of the pyrexia afforded by quinine. It seems strange that the relatively much less harmful type of pyrexia that can be induced by diathermy has not been more widely tried. Drs. C. A. Neymann and M. T. Koenig[1] have found that it is not only far safer than infective methods but also more successful, especially with depressed patients who are apt to prove more resistant to treatment than the expansive ones. Neymann and Koenig have treated 50 cases selected at random, over half having a duration of from one to five years, and have compared the results of malarial, rat-bite fever, and diathermy treatment. About 20 per cent of the patients had previously been treated with malaria and tryparsamide without appreciable results. The method of administering diathermy was that described by C. A. Neymann and S. L. Osborne,[2] but no patient was given more than 12 treatments. This, the authors say, is not enough, but the work was experimental and they were limited by circumstances. Most patients had between one and two hours' pyrexia of over 103·5° F. after each treatment. The death-rate was 18 per cent. for malaria, 10 per cent. for rat-bite fever, and nil for diathermy. The results with malaria were as good as is usual nowadays; the remissions in rat-bite fever were brief and occurred only in 8 per cent. Diathermy gave 24 per cent. remissions as compared with 22 per cent. after malaria. The criterion of remission is that the patient should regain insight and be able to leave the institution and earn money. Most of the cases only began to show improvement after the eighth or tenth treatment. The improvement rate—short of full remission—was 26 per cent. for diathermy and 22 per cent. for malaria and rat-bite fever. Of seven depressed patients treated with one or other of the fevers, only one showed improvement, while of four depressed patients treated with diathermy two went into remission and the other two were sufficiently improved to be put on parole. The serological changes did not correspond with the clinical changes; some demented cases improved serologically but not clinically, and vice versa. There are no complications in or contra-indications to diathermy treatment, provided the proper electrodes are used and the proper technique is applied, and as many as 50 treatments can be given without ill-effects. The dosage can be measured with scientific exactness, and the method can be applied by any practitioner acquainted with the elements of electrotherapy. The advantages of this method are so obvious and the disadvantages of other forms of induced pyrexia are so well known that if the results obtained by these American workers are substantiated a very great advance has been made in clinical psychiatry.

RESEARCH FACILITIES AT LINCOLN'S-INN FIELDS.

THE provision in 1930 of laboratories for research workers in rooms adjoining the Museum at the Royal College of Surgeons is described by Sir Arthur Keith in his annual report as an important development of the services which the Museum of the College renders to surgery. Hitherto research work has been carried out by the officers of the Museum and by men who found in the Museum material which elucidated the subject of their inquiry. The laboratories now provided are intended to meet the needs of another class of men altogether—young men who aspire to become members of the surgical staffs of our great hospitals.

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[1] Jour. Amer. Med. Assoc., 1931, xcvi., 1858.

[2] Ibid., xcvi., 7.

Four new research scholarships, offering £500 a year for varying terms of years, are being founded, of which the Melchett, the Bernhard Baron, and the Beaverbrook are already in working order, being held respectively by Mr. J. H. Thompson, Mr. E. G. Muir, F.R.C.S., and Mr. H. J. Burrows, F.R.C.S. A fourth scholarship is to be provided from the funds of the College. Mr. Thompson is seeking to isolate the growth-inhibiting factor from parathyroid material. Mr. Burrows is engaged on tissue culture, and Mr. Muir is studying the comparative anatomy, physiology, and pathology of the prostate gland. One of the laboratories has been assigned to Dr. G. Scott Williamson, who holds a Mackenzie Mackinnon Fellowship, and to Dr. Innes Pearce, who is working with him on the nature of the substances secreted by the thyroid gland in health and disease. Voluntary workers who are investigating problems relating to the practice of surgery are also accommodated in the laboratories, as far as space permits, and six of these are at present receiving hospitality. For the convenience of workers an animal hut has been erected on the roof of one of the laboratories, the College having gained recognition as a centre where animal experiments may be performed. These facilities, together with the research farm in the country, of which the plans are set out on p. 39, should give a fresh stimulus to surgery.

STANDARDS FOR SPAS.

HYDROTHERAPY has long been recognised as an important branch of medical treatment and a concise but comprehensive survey of the various waters available is long overdue. When the scheme by which spa treatment will be available to members of approved societies comes into operation, it will be essential for every panel practitioner to possess some knowledge of the spas and their treatments. They will have good cause to welcome the first instalment of an International Register of Spas and Mineral Waters, just issued[1] by the International Society of Medical Hydrology. The desirability of uniform methods for the expression of data led to the appointment four years ago of a standard measurements committee, under the chairmanship of Mr. S. Judd Lewis, D.Sc., which will promote the compilation of national registers of waters to form the basis of an international register. When this is done, accurate and comparable information regarding the spas and their waters will be available for every one interested. In the past analysts have expressed their results in various ways, most of them unintelligible to medical men. In the register a common form of expression designated by the letters "I.S.M." (International Society of Medical Hydrology) is given, but provision is made for the inclusion of the same results expressed in the manner customary in the country concerned and designated as "National." In the British register, the figures will at the outset be given in milligrammes per litre (I.S.M.) and grains per gallon (National). It is hoped that the National form of expression will ultimately become redundant. For the benefit of those who are accustomed to think in terms of salines, instructions are given for the calculation of the most probable combinations of the ions present in such waters and their mode of expression, but it must be borne in mind that all such combinations are hypothetical and arbitrary. Physical data are to be recorded in a standard manner, eliminating for example the confusion that arises when radioactivity results are expressed sometimes as millimicro-curies, sometimes as Maché units. Standard forms are given for recording geographical, climatological, geological, and topographical data, and the register provides for the classification of the waters according to their chemical, physical, and medical characteristics. Local information will include *methods of treatment available, facilities for* the investigation of disease, and a list of the diseases and disorders suitable for treatment. There must remain for long enough a great gulf between the precision of the analytical data and of the deductions for treatment based upon these data. Chemical analysis is a science and medicine an art; but without accurate data, treatment will remain purely empirical. Dr. Lewis and his colleagues have provided a sound basis for the superstructure that is to come.

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[1] London: Headley Brothers. Pp. 20. 1s.

THE AUSTRALIAN MEDICAL SERVICES IN THE WAR.

A HISTORY[1] of Australian medical coöperation in three very different campaigns during the late war gives a good picture of the gallant fight made against unexpected obstacles on all fronts. Many and grave were the problems of the Australian Medical Corps. On Gallipoli, for example, on April 25th, 1915, it was difficult to land, as is seen in the picture on p. 132 of this history. *The narrow beaches and steep rugged* hills were hard to climb even for men without equipment while G.H.Q. was so absorbed in the problem of reinforcing an uncertain attack as to have little time for thought for the wounded. Casualties, who had to be brought down the narrow ways impeded the reinforcements, congested the beaches, and awaited hospital ships while it was still doubtful whether ships would not rather be needed to remove an unsuccessful army. But the Navy, less closely involved, lent Neil-Robertson stretchers for lowering wounded down the cliffs and *the indefatigable senior medical* officer of *London* got many wounded off to the five ships his admiral had detailed. Thus of over 4275 casualties, 3380 were embarked for Egypt on April 26th and 27th. Later, the plague of flies which raised the number of sick all through the summer was followed by the great attack in August, to prepare for which the Australian A.D.M.S had to plead for help in clearing the beaches. Sinai and Palestine provided different problems, in some ways easier. Twice in 1916, at Magdhaba and Rafa, ambulances were recalled because attacks were said *to have failed, but the fighting lines*, who had not been told they were beaten, went on and won their battles, which was satisfactory enough, but it was hard to pick up their wounded promptly. The strenuous antimalarial campaign along the front in the summer of 1918, especially in the valley of the Jordan, 1280 feet below the sea, tired the troops; but had they known that Liman v. Sanders would later[2] charge his failure to the epidemics of malaria and dysentery, how they would have been encouraged! Of the successful cavalry operations in Sept., 1918, every one is aware, but we have not before met so detailed a description of the confusion found by the Australian Force on Oct. 1st in the hospitals of Damascus. They were without food, without drugs or appliances, without staff; all these deficiencies had to be made good in the teeth of two fierce, and by bad luck simultaneous, epidemics of malaria and influenza, which broke out on Oct. 5th. These epidemics immobilised the 4th Cavalry Division in the Lebanon, hardly sparing it enough men to feed the horses; raised the total of Turkish prisoners in the hospital from 900 to 2000; and dealt not too unkindly with a medical unit if it incapacitated a mere half of its personnel. The Australian Light Horse lent 100 non-commissioned officers and troopers, the D.M.S., E.E.F., at Ramleh sent up 100 R.A.M.C. orderlies, and somehow the situation was saved. The Anzac Field Laboratory should be mentioned. Its work was pursued far forward in the danger line, at Aleppo and Aintab, and at Jerablus on the Euphrates; its staff had to deal with cholera, diphtheria, oriental sore, dysentery, and especially malaria, achieving 32,000 examinations in two and a half years, with much travelling as well. It is interesting to read praise of prophylactic quinine; 10 cases of malaria occurred in 10 men thus treated to every 23 in untreated men during May to August, 1918, and subsequently grs. 10 daily were ordered for all troops in the great advance. It is noted that after 10,000 prophylactic treatments at Port Said for venereal disease only six cases of disease were reported; but such good results were far from universal. In New Guinea malaria and dengue were the chief troubles of the Australian force. Here prophylactic quinine was thought to have secured a lessened proportion of blackwater fever. This and other experiences will be discussed in a later volume, which promises to be as interesting as its predecessor.

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[1] The Australian Army Medical Services in the War of 1914-18. Vol. I., War Memorial, Melbourne, *1930*. *London: Australia* House. Pp. 873. *21s. 6d.*

[2] Journal of the Royal United Service Institution, 1921, p. 327.

MEDICO-LEGAL WORK IN PARIS.

A LARGE body of detective fiction has invested the Sureté with a halo of glamour. While possibly no more romantic than any other public service, the Sureté deserves its reputation for efficiency and resource. As Dr. T. H. Blench pointed out in a paper read before the Medico-Legal Society on June 25th, the Sureté is the criminal service of the Prefecture of Police and must not be confused with the Sureté Générale, which comprises the organisation of provincial police and is under the direction of the Minister of the Interior. The *police judiciaire* of the Sureté are guided by the three principles of the division of work, observation, and classification. Work is divided into four brigades. The criminal brigade deals chiefly with murders and important robberies; it is composed of skilled detectives aided by very complete scientific equipment. The brigade concerned with public highways is adept in disguise and languages. The mixed section, which deals with morals and drugs, frequents the theatres and music-halls and is expert in the niceties of evening dress, jewellery, perfumes, motor-cars and American dancing. All these brigades are assisted at need by the Service d'Identité Judiciaire. This department records the finger-prints of criminals and measurements of the body, including those of the skull, the right ear and the left foot, arm, and middle and little fingers. Identification is completed by a note of any scars, nævi, tattoo marks, or other peculiarities. The Service maintains a section the special function of which is the speedy analysis of the circumstances and surroundings of a crime; it includes a photographer, a finger-print expert, and a man whose duty it is to draw a plan of the area. There are also experts in bullets, powder-marks, blood-stains, and forgeries, in the detection of which the ultra-violet ray is of great value. Other uses of the ultra-violet ray are the analysis of substances suspected of being drugs, and the examination of semen stains.

Dr. Blench gave an interesting description of the Medico-Legal Institute of Paris, which is situated some two miles from the Palais de Justice on the Quai de la Rappée, and was completed in 1923. It grew up from the old Morgue, and contains laboratories, post-mortem rooms, facilities for instruction of students, a museum, and a library. It is able to make every kind of investigation on corpses, post-mortem specimens, foodstuffs, and every substance or object that may possess forensic significance. It instructs—besides medical students—post-graduates, magistrates, law students, police officers, and others concerned with the administration of justice. The course comprises coroner's inquests and practical investigation, and candidates are prepared for the diploma of médecin légaliste in the University of Paris. Dr. Blench pointed out that the training made medico-legal instruction in this country appear very meagre. During the ensuing discussion several speakers stressed the advantages that would be derived from the possession of a similar institution in this country. There can be very few medical men who would not profit in their daily experience from a course of instruction and from the constant coöperation of a well-equipped medico-legal institute. It would also facilitate the administration of justice. In our present hand-to-mouth system important investigations are entrusted—sometimes at very short notice—to an expert who has to rely for help far more on his genius and personal contacts than on any kind of permanent organisation. The cost of erection and of maintenance of a medico-legal institute would be considerable, but in the interests of justice the money spent would be well invested.

ANOTHER ANTHELMINTIC.

IT is well established that carbon tetrachloride produces fatty degeneration with necrosis of the liver, and less fully realised that it may also cause marked damage to the kidneys. Lamson and his colleagues[1] stress its third risk, for after study of the records of the International Health Division of the Rockefeller Foundation they have been convinced that it was only after this drug began to be used in hookworm campaigns that there first appeared certain disquieting reports. These related to treated patients who had shown evidence of activation of ascaris. Some only vomited the worms; others died, death being caused by worms blocking the air passages or knotting themselves into a ball which obstructed the gut. The search for a new drug which would avoid these risks led to the investigation of hexylresorcinol. This is a white waxy crystalline substance slightly soluble in water or mineral oil and readily so in alcohol, glycerin, and vegetable oils. Dissolved in olive oil under the name Caprokol, it has been widely used, at least in the United States, as a urinary antiseptic in doses up to 1 g. three times a day, continued for weeks without ill-effect. Lamson and his co-workers find that in dogs hexylresorcinol in doses of 0·6 g. may produce no lesions in the stomach, or there may be congestion of its mucous membrane, varying from reddening of small areas to implication of the whole with petechial hæmorrhages. Lesions disappear within 48 hours. But side by side with this congestion must perhaps be put the vomiting which has been induced by giving to children less than 8 years old a dose of 1 g.; it is probably significant that this symptom has been almost limited to those who have eaten shortly after taking the drug. As judged by colorimetric tests, a fraction only of the drug is excreted in the urine, and, indeed, the major part remains in the bowel. The drug is unpleasant to take; the taste is easily disguised in glycerin or vegetable oils, but if this be done anthelmintic efficiency is greatly lessened. Accordingly in the work reported the drug was given in hard gelatine capsules; but these must be freshly filled, since the drug acts on the capsule and renders it unstable. The single doses given varied from 1 g. to 0·4 g.; many of the patients treated were children, and the information is not so arranged that it can be determined whether or not the smaller doses were given to these. It is stated that for adults a dose of 0·5 g. was less effective than a larger one.

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[1] Lamson, P. D., Brown, H. W., Robbins, B. H., and Ward, C. B.: Field Treatment of Ascariasis, Ancylostomiasis and Trichuriasis with Hexylresorcinol, Amer. Jour. Hyg., 1931, xiii., 803.

The outstanding feature in regard to anthelmintic value lies in the readiness with which the drug combines with albumin and becomes inert. In the intestinal canal this is held to limit its action to the superficial layer of the epithelium, in spite of the vascular dilatation and rupture of blood-vessels which the writers themselves have reported beneath this. At all events the eating of food even five hours before taking the drug lessens its vermicidal power so strikingly that the writers believe, though they do not seem to have tested the matter, that to get the best effects from it nothing should be taken on the previous evening except a little bread and milk. Salts should be taken on rising, hexylresorcinol several hours later; and the first food of the day four or five hours after treatment.

The results of treatment have apparently been assessed on the examination of a two-hundredth of a gramme of fæces, and these workers italicise the point that their results are based on the accuracy of the diagnostic method they used. In ascaris infection treatment has given results in different groups varying between complete disinfestation on the one hand, and on the other a complete failure to disinfest but with a lessened number of worms, the critical factor in this case being the taking of food or the use of an unsuitable vehicle. In hookworm infection the result in fasting persons of doses up to 1 g. was an observed reduction in eggs by about 80 per cent., the obviously uncured varying from about 40 per cent. to about 60 per cent.; while for trichuris infection the observed reduction in eggs in the fasting was about 50 per cent. and the obviously uncured lay between about 50 per cent. and 80 per cent. Owing to the large numbers of eggs passed by a female ascaris it cannot reasonably be doubted that those persons who appeared to be disinfested were actually rid of all female worms. In the case of hookworms and whipworms the real percentage of uncured was undoubtedly considerably higher than the figures suggest, for, if a worm lays eggs at such a rate that one egg is found in a thirtieth or a fourtieth of a gramme, disinfestation cannot be determined by the examination of a two-hundredth of a gramme. The writers add valuable tables which show the estimated anthelmintic efficiency obtained in these infections by other workers with other drugs. It does not seem that hexylresorcinol will displace them by reason of greater potency, particularly in view of the strict and intelligent coöperation which the patient must give before even reasonably good results are obtainable with the anthelmintic.

THE RELIEF OF PAIN IN CANCER OF THE BLADDER.

THE discussion on the treatment of inoperable carcinoma of the bladder, reported on p. 20, brought to light much that is interesting. Everyone who has had to deal with this type of case must have been impressed by the amount of suffering that vesical carcinoma often entails to the patient, and by the inefficacy of present methods of treatment to relieve it. In spite of the advances made in radium therapy it was admitted both by Mr. R. Ogier Ward, who opened the discussion, and by the subsequent speakers that results obtained in inoperable growths of the bladder are disappointing. Although in Mr. Ward's hands the implantation of seeds through a cystoscope has brought relief to a few patients, no case of cure has been reported, and many of the speakers admitted that the more usual practice of transfixing the growth with radium needles has actually increased, rather than reduced, the sufferings of their patients. This failure of radium can in part be accounted for by the special difficulties that exist in eradiating the bladder, but it is probable that this is not the sole explanation. The tendency in radium treatment to-day is to diminish the dose of the element and increase the time over which it is allowed to act. In the treatment of carcinoma of the cervix it has become customary to repeat the treatment after a short interval, and it is possible that were this fractional method to be adopted in vesical carcinoma better results would be obtained. The use of massive doses in an attempt to destroy a growth at a single sitting only results in the production of a sloughing sore and an increase of the patient's discomfort. But whether by improved technique we can ever hope to produce in bladder growths the same satisfactory results as those obtained in cervical or mammary carcinoma is doubtful, and it is important, in the meantime, to explore every possible way of relieving the patient of the worst of his sufferings. For this reason the latter portion of Mr. Ogier Ward's paper, in which he deals with the use of nerve section as a means of abolishing the agonising pain usually associated with inoperable bladder growths, is of special interest. So far, two methods of doing this have been used, namely, chordotomy, or division of the antero-lateral tracts, and removal of the presacral nerves. Of these methods the former is, of course, the more reliable, since it effectually blocks all painful stimuli coming from the pelvic viscera and lower limbs, but as it entails a somewhat severe operation its use must be limited. Destruction of the presacral nerves has the advantage of being a less serious operation and one that can be performed through the same incision as that required for an exploration of the bladder. Although it is difficult on anatomical grounds to explain the rationale of destruction of the presacral nerves it would appear, both from the work that has been done in Germany, and from Mr. Ogier Ward's more limited experience, that the method gives good results, even when the pain is not limited to dysuria. Possibly, as Mr. Ward suggests, the action is an indirect one, due to the alteration in the tone of the bladder wall which the interference with its nerve supply produces. At any rate the method is one that should be fully tested.

PSYCHOLOGY OF THE EMIGRANT.

EMIGRANTS of all classes desiring to live permanently in Canada must submit to a medical examination prior to embarkation and certain British practitioners have accepted the responsibility of conducting these examinations under a roster scheme. The *Medical Officer* in its current issue quotes a note which is being included in the instructions to these practitioners which is of interest chiefly for the emphasis laid on the psychological rather than on the physical stress associated with a complete change of environment. Not only climatic changes but comparative isolation in outlying districts, change in money standard, food, cooking, and dwellings; complete change in local interests and details regarding social life and activities; difference in customs and routine methods of doing work and business generally, all these tend to produce a period of home-sickness of such severity as to be really disabling. Disappointment may arise, too, from the erroneous idea that less work will produce a better living in the new country. Moreover, the release from the restraining influences of the home environment is often too much for persons lacking in self-control or moral responsibility.

It is held to be of particular importance, therefore, in examining prospective emigrants to detect not only the obvious physical or mental defective, but also those individuals who possess defective judgment, instability of the nervous system, or who are emotionally hypersensitive. This task will be made more difficult by the fact that it is often just these people who have been oppressed by the difficulties of life in Europe and are often anxious to make a new start. They may be unlikely to make good elsewhere, but it seems to us harsh to deprive them of the opportunity. The Canadian government believe, however, that a close and friendly coöperation between the British medical man making the examination and the Canadian medical officer, specially trained in immigration medical work, will mitigate suffering and hardship on the part of the immigrant, as well as relieve the financial burden on Canadian public funds resulting from the physical or mental collapse of new settlers.

TUBERCULOSIS CONFERENCE AT MARGATE.

THE 17th annual conference of the National Association for Prevention of Tuberculosis, held last week at Margate, centred on the child, and that for two reasons. It is realised that the secret of the adolescent peak of tuberculosis mortality is probably hidden in the period immediately preceding adolescence. The raising of the school age will enable much more to be accomplished in protecting the child. The various sessions of the conference were devoted to different periods in child life and the appropriate measures of protection. Some of the papers are briefly summarised on p. 22 of this issue. Sir Robert Philip, whose introductory address while directed to the layman's understanding was yet informative to the medical man, expressed a wish that the tuberculin test should become universal. It was our biggest weapon for discovering that infection had taken place, and the basis of our means for protecting the child. Like other speakers, he thought the case for B C G unproved. Closer liaison was desirable between tuberculosis and child welfare departments, and success was to the community which would search out positive reactors and attend to their environment. Dr. Eugene Opie set out attractively his conception of adult phthisis as a second infection, modified by a partial immunity. By means of stereoscopic X ray films and the tuberculin test, grave pulmonary lesions could be discovered in children long before the disease had produced destructive changes. Two per cent. of school-children between 14 and 18 years of age had, he said, dangerous lesions of the lung parenchyma, although only a quarter of them revealed it by symptoms or physical signs. But the view that adult disease develops from latent disease in childhood did not go unchallenged. Dr. N. D. Bardswell said he had found the development of tubercle in adolescence as a rule independent of any previous history of ill-health; and Dr. Letitia Fairfield regarded the entrance into industry as the determining factor. There was no hint, she said, of increased incidence among secondary school-children; why the resistance fell so precipitately on leaving school was an urgent matter for inquiry. The protection of the child during the pre-school and school years was ably developed by speakers. Dr. Midgley Turner spoke persuasively of the "dilution" of tuberculosis by general education of the public; the open case of phthisis was the crux of the problem. He outlined the Sheffield scheme for isolating the infant of a tuberculous mother for twelve months after birth; others doubted whether parents in this country could be persuaded to adopt the Grancher system. Dr. R. H. Crowley described the newer developments of hygiene in schools, and the changing orientation of our education, which is coming to regard the child as a whole. If the conference has immediate results it will be in the direction of making X ray examinations and tuberculin testing more common among school-children throughout the country, and in measures to prevent infection through the open pulmonary case. On the question of infection through milk, opinions were sharply conflicting.

DR. J. A. Campbell Kynoch, Emeritus Professor of Obstetrics at St. Andrews University, died suddenly on June 23rd. He was a graduate in medicine of Edinburgh University, and studied midwifery and gynæcology in Berlin, Vienna, Bonn, and Munich. He was the first Professor of Midwifery appointed when the Conjoint Medical School was established in Dundee and for many years was Dean of the Faculty of Medicine at St. Andrews University.

THE death occurred of Mr. Edward Beadon Turner on Tuesday last, June 30th, at his London residence. For five years a member of the General Medical Council, a medical reformer, health-worker, and athlete, he was well known by a great public outside his profession, and his death will be widely regretted. A notice of his career will be published later.

EXTENSION OF DUDLEY GUEST HOSPITAL.—A new wing of the Guest Hospital, Dudley, was opened by Princess Mary last December, and it has now been decided to erect another similar wing containing two main wards and six single-bed wards, providing 54 beds in all. The work will cost £30,000, and to make room for the additional nurses who will be needed the Helen Thompson Memorial Nurses' Home is to be enlarged at the cost of a private donor. Six months' experience of the new wing has shown that the hospital is still inadequate to the demands made upon it, the waiting list having continued to grow.

PANEL AND CONTRACT PRACTICE

THE INFLUENCE OF HEALTH INSURANCE UPON HOSPITAL PRACTICE.*

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THOSE who minister to the health of the people are no longer limited to the profession of medicine. There are those who carry out the treatment we order: the nurse, the masseur, and the electrotherapist. There are those who supply us with the wherewithal to do this: the pharmacist and the instrument-maker. There are those who provide for us the accommodation in which it can be done—the architect, the engineer, and the builder. In each of these branches the work has become specialised. And there is the administrator. If I speak more of him it is not that I give him pride of place, or think him either more or less important than the others, but because his importance has not, as yet, been recognised, especially by the medical profession; and when he is recognised it has often been rather to jeer at his failings than to sympathise with his difficulties and to help him in his work. We live, however, in an age of team-work, and whether one deals with the League of Nations or with the organisation of health insurance the work of each has to be fitted into that of another like the pieces of a mosaic.

Administrators may be divided into: (1) those who deal with the health of the people on wide general principles, in the office of the government of the municipality or at the headquarters of the great charitable organisation; (2) those who work out these general principles in broad detail, in the offices of the hospital, of the treatment clinic, or of the ambulance service; and (3) those who carry out the minute details in close association with the individual patient—the social service worker, the almoner, and the secretary. In the background, over all and yet the servant of all, is he who deals with finance.

Of all this elaborate organisation each unit of the people asks two things: to be kept well when in health, and to be returned to it again when health fails. And if this last be impossible they ask to be relieved of pain and discomfort and to be enabled to carry on with their life's work so far as they can.

The art of keeping the people well is of two parts: the first is public health, the second is personal hygiene. With the first, health insurance does not deal; but in our country personal hygiene has always been reckoned as a part of health insurance. This is inherent in the very first words[1] which Mr. Lloyd George used when, as Chancellor of the Exchequer, on May 4th, 1911, he asked leave of the House of Commons to introduce a Bill to provide for insurance, amongst other things, for the prevention and cure of sickness. It is true that as yet but little has been done under this head; but it remains a part of our national policy and may at any time be taken up.

Treatment when Ill.

The doctor holds the key position to this subject. Up to now the medical benefit in the British Insurance Acts only includes services involving the application of skill and experience of a degree or kind which general practitioners as a class can reasonably be expected to possess. Not that it has ever been the national policy so to limit it. The services to be rendered by the general practitioner were the foundation upon which a complete superstructure could later be built. The National Health Medical Service came into force in Great Britain on July 15th, 1912, but the superstructure has not as yet been added. In the spring of 1914 Mr. Lloyd George proposed an extension of the Insurance Scheme to include specialist and laboratory service, and the money for this was actually voted by Parliament on August 4th, 1914. Then came the great hiatus in the even tenor of our ways, and we have not yet reached a new normal of our national life. The result of this is that our National Health Insurance scheme has never had a normal year in which to work. There were but two years in which to get things going before the world went sick. During later years we have worked at it in a period of the world's convalescence.

So far as the past is concerned, I can find no evidence that in England, or at any rate in London, the institution of the National Health Insurance system has had any material effect upon hospital practice. In their out-patient work the hospitals deal chiefly with patients who need specialist treatment. This was not included in our national health scheme, and it is not surprising that the institution of the scheme has had no influence upon the attendances and work of these departments. The out-patient departments dealing with general medicine and surgery do, however, deal with a certain number of cases which should be included under the work that can be done by the general practitioner. These patients were included among those who could not afford to pay the doctor for individual attendances It is probable that there was some decrease in their number when the national health scheme came into being. The decrease, however, was not great. The scheme applied only to the workers, not to those dependent upon the worker, who made up the majority of such persons attending hospital. Actually the worker could not himself afford to go to hospital; the amount it cost him by the loss of pay for half a day's work was greater than the amount he had to pay to see his doctor in the evening. Even though there was some falling-off in the attendances in these departments, in relation to the whole work of a great institution, such as that which I have the honour to serve, the effect was infinitesimal and has not been felt in the general life of the place. It is, however, probable that to-day the system is having an indirect influence which may be felt but of which no statistics can be gained. I put before you, therefore, various suggestions that are adduced from different quarters.

First it is suggested that the practitioner in charge of the case is inclined at once to send the patient on to the hospital as soon as he realises that he is suffering from some condition that would come under the category of specialist services. It is true that the total number of patients attending such departments —e.g., that dealing with diseases of the nose, throat, and ear—has been on the increase in recent years, but there is no evidence to show that this increase is especially among the insured population and is not explained by the general increase in attention to such diseases among the population as a whole.

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* Abridged from address delivered on June 8th at the Second International Hospital Congress held at Vienna.

[1] Hansard, fifth series, vol. xxv., 609.

If such an increase of attendances among the insured population has occurred, it must be credited to the National Health Insurance scheme that these patients are now getting the specialist treatment that they need.

Again we hear it said that when a general practitioner sends his patient to the hospital he loses touch with him and hears no more about him. This resolves itself into the need of some organisation whereby the clerical work of keeping touch between one doctor and another can be put upon a sound basis and it shall not be left to the energies of a tired specialist to write or dictate a number of letters at the end of a long day.

The provision of additional benefits has resulted in a certain sum of money being paid by the approved societies to the voluntary hospitals. This money has been of value to them, but has not had any direct influence upon the practice in these institutions.

Perhaps the most important way in which the Insurance Acts have had an influence upon the practice of our hospitals is that they have influenced the practitioner in sending his patients suffering from some acute disease into these institutions at an earlier stage of the illness. The evidence in favour of this is quite indirect and it may be due to the slow influence of medical education rather than to the Insurance Acts. That cases are less often sent up in advanced stages of acute disease is, however, all to the good.

The Hospital of the Future.

We turn then to the future. Upon this we can have no evidence. We can but indicate the lines upon which we feel things must evolve. Our great philosopher-statesman of the last generation, John Morley, spoke[2] of the three independent provinces of compromise as being "a wise suspense in forming opinions, a wise reserve in expressing them, and a wise tardiness in trying to realise them." He urged that if a subject is not ripe for practical treatment you and I are not, therefore, entirely relieved from the duty of having clear ideas about it.

> "As it is," he added, "everybody knows that questions are inadequately discussed or often not discussed at all, on the ground that the time is not yet come for their solution. Then when some unforeseen perturbation, or the natural course of things, forces on the time for their solution, they are settled in a slovenly, imperfect, and often downright vicious manner, from the fact that opinion has not been prepared for solving them in an efficient and perfect manner."

We may then agree that it is the building of the superstructure of which the general practitioner service was to be the foundation that will have an influence upon our hospital practice.

This superstructure may be expected to consist of three parts: the provision of laboratory services, the provision of consultation and advice by the specialist branches of the medical profession, and the provision of the necessary in-patient hospital treatment in order that this advice may be carried out. We have learnt that the provision of the first two parts was accepted in principle by the British Parliament 17 years ago. Our Ministry of Health has never ceased to consider the subject and to watch for a suitable opportunity to introduce these two services; on the other hand, it has never favoured any scheme of provision of in-patient treatment, primarily because of the prohibitive cost. The provision of laboratory aids to diagnosis and of specialist advice would not be of very great benefit to the insured person were there no arrangement whereby he could receive the necessary in-patient treatment that frequently must be the corollary of such advice. Fortunately in our country things have so evolved that the provision of in-patient treatment under any health insurance scheme has become unnecessary.

On April 1st, 1930, there came into force an Act introduced by Mr. Neville Chamberlain which did away with our ancient poor-law and in doing so transferred all the public hospitals to the care of the county councils. In doing this the Government of the day set out as the policy of the nation that these hospitals should be raised in their equipment and their efficiency to the highest possible standard; and the Government of to-day has shouldered the task of seeing that this is carried out. In the old days destitution was the criterion for admission to these hospitals and had to be proved by anyone applying for admission. Under the new Act "ad hoc" poverty is the criterion for admission and, considering the high cost of in-patient, surgical, and medical treatment there can be none who come under the National Insurance Acts who cannot make this claim.

When National Insurance is extended to the specialist services the man who pays his insurance money will already be paying for the upkeep of these institutions through the rates. He has already the right of admission into them. It is clear that he will not pay a second time towards them by his weekly insurance subscription.

The influence of health insurance upon hospital practice in the future therefore depends upon the extension of the benefit to specialist consultation and laboratory services. There is, however, another way in which insurance may be extended; and that is towards the dependents of the insured people. We may well assume that that has taken a place in our consideration of the future.

These consultations will be held in out-patient departments attached to hospitals or in new clinics specially organised and provided for them. The need for close association between out-patient and in-patient treatment will make it desirable that they should be held in clinics attached to in-patient hospitals. If all those who will come under National Insurance be removed from the present out-patient departments, the activities of these departments will practically have disappeared. At the clinic to which the insured person goes, he will claim that he be not kept waiting too long. At present the amount of time spent in waiting at an out-patient department is so great that many wage-earners cannot afford it. No attempt is as yet made, by organisation and appointment, to limit this time of waiting. When the insured person has paid by his subscription for his attendance, he will be able to insist upon an attempt being made to shorten his wait. He must not expect too much. It is impossible for a doctor to stick rigidly to a schedule; one patient may take him an hour, the next two or three may take but a quarter of an hour each; or, alternately, two or three successive cases may need each an hour's attention. The doctor who makes appointments at half an hour's interval and never gets behindhand is not usually a good doctor, and some degree of waiting must be expected towards the end of a session.

Next the insured person may claim that if the doctor in the out-patient department says he must come into the hospital, he should not be kept waiting unduly long. Some delay must happen in all but acute cases, but the long waiting-list of to-day, whereby some patients wait for a year or more, must become a thing of the past and the period of waiting be reduced to a month at the longest. Here again he may lose something by improved organisation. Speaking as a surgeon, I find that the long waiting-list, if used properly, is the finest sieve whereby to sort out those cases that really need operation from those in whom I have advised it unnecessarily. I find that those who fall to the bottom of the waiting-list and have been on it for more than six months include nearly all of the latter, and a further examination will often make me advise against the operation of which I had previously been in favour.

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[2] On Compromise, Eversley edition, pp. 94, 95, and 99. London: Macmillan and Co.

The best way, however, of preventing operations being advised unnecessarily will be by the third point on which the insured person will insist: that is, that the amount of time allotted to the consideration of his or her condition shall not be less than a certain minimum. There is no more potent cause of operations being advised unnecessarily than a hurried examination. Again I speak with the experience of one in charge of an out-patient clinic where more persons attend than I can adequately treat. The minimum period will vary for each type of clinic and must be somewhat elastic, but within certain limits it will be necessary to keep to it.

These three demands my supposed worker will ask for his dependants as well as for himself; but the next applies to him (or her) only. It is that the clinics shall be held at an hour at which he can attend. This will mean the institution of evening sessions.

Next he may demand that if his complaint entails admission to hospital he shall be admitted under someone in whom he has confidence, who will usually be the physician or surgeon that he has seen at the out-patient clinic, or someone in close touch with him. This will mean that the out-patient department must be a part of the same institution as the in-patient clinic, not that it need be on the same site. It is probable that in big cities we shall evolve along the lines of out-patient clinics and admission blocks in the centre of the town with the in-patient hospital on the outskirts. The telephone and the ambulance have made it unnecessary to have the two together, but it is still necessary that the same doctors should be in charge of both. This question of keeping in touch will become more and more important as time goes on. The specialist must keep in touch with the general practitioner as well as with his brother specialists, and all with the various persons who carry out the treatment prescribed. To this end, members of the clerical staff must be attached to each out-patient clinic under the doctor in charge of it. Such an arrangement is already in existence in London in association with the care of school-children. It works very well indeed; and may be taken as an example from which a similar organisation may be planned for adult clinics.

The Question of Certification and the Education of the Student.

There is in England to-day an anxiety as to the finance of our National Health Insurance, because so many more people than previously are claiming sickness benefit. Of the various causes for this, one is said to be that doctors are not strict enough in the way in which they issue the medical certificate which is the key to this benefit. If this is so, it is very probable that the greatest abuse comes from certificates given in the out-patient departments of hospitals. I suggest that this problem may be solved by the authority that pays the sickness benefit providing the clerical staff to do the duties of liaison indicated above.

The treatment of the next generation depends upon the education of the doctors in this. Students before and after graduation cannot be taught unless there are patients about whom to teach. It is, therefore, in the interest of all that all should present themselves as cases for education. It is often suggested that when the people pay for their own treatment, instead of being dependent upon charity, they will resent being talked about. I do not believe this will be so. In an experience of teaching of a quarter of a century I have hardly ever found a patient who has objected to my teaching. Nurses, students, and personal friends who have been under my care have always been willing to allow me to exemplify my teaching by their condition. Private patients are always willing to be demonstrated to colleagues. There is no reason that any one should object if the teaching is kind; and it should be recognised that anyone attending a National Insurance out-patient clinic or going into any State or municipal hospital should do so on the understanding that they may be an object-lesson in teaching should the authorities think it necessary.

We have seen at every turn how the question of finance crops up. It must dominate all hospital administration in the future as it has done in the past. We may well say that the health of the nation is so important that no expense should be spared in maintaining it. That is so, but we must equally remember that there must be no waste. We have the contrast on the one side between expenditure and wasteful extravagance, and on the other between economy and stinginess. This struggle must always go on, and always the pendulum will be on the swing from one side to the other. So also with the pay of all concerned. The health of the individual cannot be treated purely as a business concern, and everyone who enters the service of the sick must be prepared to give more than is exactly in the bond. The labourer is worthy of his hire; but we must also remember the parable of the talents. We must be prepared to give account of what is entrusted to our care, or it will be taken from us. This must apply to the administrative staff as well as to the medical and nursing professions to an extent that perhaps is not realised enough.

These principles raise as matters of detail other problems. For instance, do we need two types of hospital to-day—the voluntary and the State? If we do, how is the work to be distributed between the two? If we do not, how are the voluntary hospitals to be absorbed under the State without a dislocation of their work? In our country insurance is national and any development must be on national lines. One thing only I demand: that is the care of the patient. So long as the treatment is good, he will not mind whether he goes into a hospital that is under the direct control of the central government, of the municipality, or of some individual organisation. This care will depend in the future upon efficient administration. The moment medicine passes from the hands of the individual to the team, administration becomes necessary. Administration means regulations, and these must be drafted to fit the diseases from which man suffers. His illnesses cannot be changed to fit the regulations. In carrying out these rules the widest elasticity must be allowed. No code can be drawn up to fit every person's illness. The doctor must be prepared to ride through every regulation in the interest of his patient if he thinks it necessary. In this he has a great responsibility, for if he fails to do so he may be brought to account. But when he does it he must justify his action and show good cause. The power to shoulder this responsibility is a necessary adjunct to his professional skill. Knowledge alone never made a good doctor. Character also is essential.

INSURANCE PRACTITIONER AND SICKNESS CLAIMS.

Referring to Memorandum 329/I.G. issued by the Minister of Health, summarised in our issue of June 13th (p. 1311) and commented on in our issue of June 20th (p. 1370), Dr. J. C. G. Dickinson (Braunton, N. Devon), writes: "There are certain important factors which largely vitiate the accuracy of the conclusions drawn by the Ministry from their figures. In the first place we are not informed as to the average period of sickness before reference by the approved society, nor of the degree of unemployment in the areas chosen for the compilation of statistics. In areas where unemployment is very great the tendency is to remain on the higher paid dole rather than to go on to the lower paid panel pay, and in these areas certification will tend to appear more satisfactory. No information is given of the number, if any, of cases referred to regional officers by panel practitioners, and of the results. It is agreed apparently on both sides that cases of great difficulty arise. I purposely avoid the term malingerer. But let it be asked: Have the regional officers been found capable of facing up to these very difficult cases? Personally I think not; and are they as negligible in effect as the Ministry appear to think? If one such case is let slip in every panel practice in the country, the total number may be small—some 20,000 in all—but their influence on fellow-patients is very great.

"What remedy is suggested? I suggest that regional officers might show greater courage in dealing with these very difficult cases. Further, when a panel patient referred by his society is found not to be incapable of work by the regional officer, or if the panel practitioner considers the man fit for work and the regional officer decides he is unfit, then in each case the patient be automatically removed from the list of the panel practitioner—the patient to have the right to apply to be retaken on the panel of the doctor concerned. In order to tighten up certification and maintain the standard of private practice it is necessary that the patient should have free choice of doctor, but also that the doctor should equally maintain the right to refuse or discard a patient."

INFECTIOUS DISEASE

IN ENGLAND AND WALES DURING THE WEEK ENDED JUNE 20TH, 1931.

Notifications.—The following cases of infectious disease were notified during the week:—Small-pox, 62; scarlet fever, 1393; diphtheria, 877; enteric fever, 30; pneumonia, 566; puerperal fever, 46; puerperal pyrexia, 92; cerebro-spinal fever, 47; acute poliomyelitis, 6; encephalitis lethargica, 11; dysentery, 14; ophthalmia neonatorum, 109. No case of cholera, plague, or typhus fever was notified during the week.

The number of cases in the Infectious Hospitals of the London County Council on June 23rd-24th was as follows: Small-pox, 138 under treatment, 2 under observation (last week 152 and 3 respectively); scarlet fever, 1101; diphtheria, 1409; enteric fever, 13; measles, 140; whooping-cough, 429; puerperal fever. 33 (plus 7 babies); encephalitis lethargica, 202; poliomyelitis, 2; "other diseases," 158. At St. Margaret's Hospital there were 14 babies (plus 6 mothers) with ophthalmia neonatorum.

Deaths.—In the aggregate of great towns, including London, there was no death from small-pox, 2 (1) from enteric fever, 26 (0) from measles, 1 (0) from scarlet fever, 17 (5) from whooping-cough, 24 (3) from diphtheria, 38 (5) from diarrhœa and enteritis under two years, and 20 (3) from influenza. The figures in parentheses are those for London itself.

The fatal case of enteric fever outside London occurred at Sheffield. Only one death (under 1 year) from meningococcal meningitis was reported in London. Six deaths from measles occurred in Leeds, 4 in Sunderland, and 3 in Birmingham. Diphtheria claimed 3 victims each at Manchester and Rochdale.

The number of stillbirths notified during the week was 331 (corresponding to a rate of 48 per 1000 births), including 52 in London.

THE SERVICES

ROYAL NAVAL MEDICAL SERVICE.

Surg. Lt. (Emerg.) R. Schofield to be Surg. Lt.-Comdr. (Emerg.).

The following appointments are notified: Surg. Comdr. E. C. Holtom to *London*; Surg. Lt. J. L. Cox to *Victory* for R.N. Barracks.

ROYAL NAVAL VOLUNTEER RESERVE.

The following appointments are notified: Surg. Lt.-Comdr. A. S. Bradlaw to *Victory* for R.N. Barracks; Surg.-Lts. R. M. Buchanan and J. F. Heggie (proby.) to *Frobisher.*

ROYAL ARMY MEDICAL CORPS.

Lt. S. M. Burrows to be Capt. and remains secd.

ARMY RESERVE OF OFFICERS.

Lt.-Col. R. C. Wilson, having attained the age-limit of liability to recall, ceases to belong to the Res. of Off.

Capt. W. S. C. Copeman from R.A.M.C., T.A., Res. of Off., to be Lt.

TERRITORIAL ARMY.

Capts. W. Baxter, G. V. Davies, and C. W. Dudley, to be Majs.

Capt. A. J. Will (late R.A.M.C.) to be Capt.

Capt. R. P. S. Kelman, New Zealand Medical Corps, to be Capt.

Lt. C. L. Broomhead to be Capt.

Lt. A. R. C. Higham, from 92nd (5th Lond.) Fd. Bde., R.A. (T.A.), to be Lt.

H. F. Wattsford (late Cadet, R.A.F.), to be Lt.

TERRITORIAL ARMY RESERVE OF OFFICERS.

Capt. W. S. C. Copeman relinquishes his commn. on appt. to the Supp. Res. of Off.

INDIAN MEDICAL SERVICE.

Lt. (on prob.) B. Temple-Raston to be Capt. (on prob.) (prov.).

ROYAL AIR FORCE.

E. K. Pritchard is granted a temporary commission as a Flying Officer.

Flying Officer W. J. Cumming, relinquishes his short service commission on account of ill-health.

AUXILIARY AIR FORCE.

T. E. Cawthorne to be Flying Officer, No. 601 (County of London) (Bomber) Squadron.

MENTIONED IN DESPATCHES.

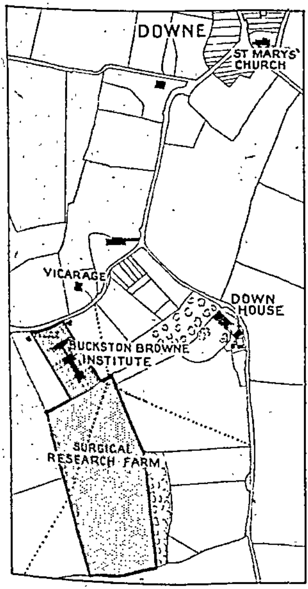
Maj. M. P. Power, R.A.M.C., has been brought to notice for distinguished services rendered during Operations on the North-West Frontier of India during the period April 23rd to Sept. 12th, 1930, by Field-Marshal Sir William Birdwood late Commander-in-Chief in India.

Opening of New Cottage Hospitals.—On Friday last week Prince George formally opened a cottage hospital at Newquay. The building is paid for but is not to be opened to patients until enough money is in hand for a year's working; for this another £500 is needed.—Also last week Lord Mildmay of Flete, Lord-Lieutenant of Devon, opened an extension of the Victoria Cottage Hospital at Sidmouth. The enlargement, which has cost £15,000, increases the number of beds from 14 to 30, including a small provision for paying patients.

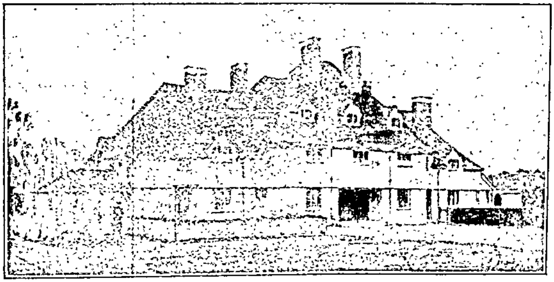
SPECIAL ARTICLES

THE BUCKSTON BROWNE SURGICAL RESEARCH FARM.

The foundation-stone of this research institute will be laid by Lord Moynihan at Downe, Farnborough, Kent, on July 8th, at 4 P.M. It will be recalled that early this year the Royal College of Surgeons of England received from Mr. G. Buckston Browne the means to build, equip, and endow a biological station in the country for the purpose of experimental surgical research. In this year's annual report on the museum of the College by its conservator, Sir Arthur Keith, an account is given of the way this benefaction, which will ultimately reach a sum of £100,000, is being spent. The site selected was one in the parish of Downe, Kent, adjacent to the grounds of Down House, where Darwin lived for 40 years. This house had previously been purchased for the nation by Mr. Buckston Browne as a memorial to Darwin and the acquisition of an adjoining site, for the biological station had the advantage of preserving the amenities of Down House. The site selected for the research farm is 16 miles from Charing Cross, and can be reached in 45 minutes by train and car. The institute to be built on this site is to provide (1) a series of suitable animal houses and huts; (2) experimental laboratories as efficiently and cleanly equipped as operating theatres of hospitals, with sick wards attached; (3) a residential block to provide accommodation for research workers and for the men in charge of the buildings and of the animals.



Sketch-plan showing the site of the Research Farm.



The Buckston Browne Surgical Research Institute.

Provision of comfortable residential quarters for the research workers is an essential part of the scheme, since it is believed that to bring together under a common roof a group of men, chosen from various hospitals and bound by a common object—that of advancing the resources of surgery—should do much to weld together the surgical enterprise of London and of the provinces. The residential block has been designed by Mr. E. C. Frere, F.R.I.B.A., on the lines of a Kentish farmhouse, and his design has been approved. The other parts of his plans—i.e., experimental laboratories and wards, and animal houses—are still under consideration. The buildings are to be as modest as is compatible with fulfilment of the purpose they are to serve, and as much as possible of the capital will be preserved to provide an income for the upkeep of the farm, and to furnish young surgeons with the equipment and material needed for their research. The supervision of the work carried on in the laboratories of the College and at the research farm will be entrusted to the conservator of the museum.

EPSOM COLLEGE.

An extraordinary general meeting of the governors of Epsom College was held on Friday last, June 26th, at the Royal College of Physicians of London, Viscount Burnham, President of the College, presiding. The object of the meeting was to consider, and, if thought fit, pass the following resolutions :—

That the Council of Epsom College be and is hereby authorised to promote legislation to amend, extend and repeal the provisions of the Royal Medical Benevolent College Act, 1855, and the Royal Medical Benevolent College Act, 1894, so far as may be requisite or convenient for the following purposes, that is to say :—

1. To effect the abolition of the present method of election of Pensioners, Foundation scholars and Annuitants by the governors of the College, and to substitute therefor election of Pensioners, Foundation scholars and Annuitants by a committee to be appointed by the Council and to consist of 20 governors, of whom ten shall be members of the Council and ten shall be governors (not being members of the Council) whom the Council shall select annually as most adequately representing the varied interests of the medical profession.

2. To provide for the extension of the benefits of the charity so as (*a*) to enable pensions to be provided for medical women (but not for their widowers unless such widowers are otherwise eligible) on the same conditions as

for medical men; (*b*) to render the sons of medical women eligible for election as Foundation scholars on the same conditions as the sons of medical men; and (*c*) to enable annuities or occasional pecuniary assistance to be provided for medical women or their families (but not for their widowers unless such widowers are otherwise eligible) on the same conditions as such annuities and assistance may be provided for medical men or their families.

The first resolution, revising the method of election, was proposed by Dr. Raymond Crawfurd, chairman of the Council, who said that Epsom College was administered under two Acts of Parliament, an Act of 1855, and an amending Act of 1894. By the 1855 Act it was decreed that the selection of beneficiaries should be by the governors, who in turn were the subscribers and donors. The purpose of this was to secure funds for maintenance. This, he said, had been done, but with a measure of success not adequate to the complete relief of destitution in the profession. "The Council have for years," he continued, "been anxious to abolish the voting system, and this spring decided to ascertain the views of the governors by circulation of a questionaire to all the 5500 of them. The result was that close on 93 per cent. voted for abolition; the percentage would have been much higher had it been practicable to give a detailed statement of the exact method of replacing the voting system. The reason why the Council have not taken action before is that they could not face the expense of passing a private Bill through Parliament." This difficulty had been surmounted, he added, by the very friendly attitude of certain public Departments who have undertaken jointly to submit to Parliament the necessary legislative changes as part of their annual parliamentary scheme. Admitting that the Council had been anxious as to the amount of pecuniary support they would lose by the abolition of the general vote, Dr. Crawfurd added that they believed their loss would be small, and even hoped that the more democratic method for the selection of beneficiaries in future would attract a larger number of supporters. If the resolution were passed the selecting body, he said, would be ten members of the Council and ten governors not members of the Council; they would be appointed, as a rule, by other medical bodies at the invitation of the Council, and all parts of the country successively would obtain a direct voice.

The resolution was seconded by Dr. H. B. Brackenbury, and was passed unanimously.

Dr. Crawfurd then proposed the second resolution which would provide for the extension of the benefits of the Foundation to women on the same terms, with one reservation, as those now enjoyed by men. He pointed out that the exclusion of medical women and their children from the benefits of the Charity was due to the fact that in 1855 medical women did not exist in this country, and in 1894 they were still looked at askance. But with women admitted to the profession on equal terms with men it became manifest that their exclusion was an anomaly and an injustice. Such was the change in the position of medical women by 1931 that the proposal for the inclusion of them and their children in the benefits of the Charity was carried by a unanimous vote of the Council.

The resolution was seconded by Dr. Brackenbury, and here also a unanimous vote was recorded by the meeting.

ELECTIONS.

The following were the results of the annual elections which were announced at the annual general meeting which immediately preceded the extraordinary meeting:—

Pensionerships.

	Votes.
Marin, Mrs. Edith M.	3523
Shortridge, Mrs. Louisa	3407

* Hadlow pensioner. † Ordinary pensioner.

"Morgan" Annuity.

	Votes.
Waring, Miss S. Annette	3342

Foundation Scholarships.

	Votes.
Ring, Charles A. S.	12,436
Hyde, Edward K.	10,856
Purnell, James A. W.	10,672
Smith, Hugh F. S.	10,411
Evans, Raymond F. G.	9614
Reid, Alexander P.	8308
Walker, Robert G.	7075
Armitage, Raymond S.	5738

UNITED STATES OF AMERICA.

(FROM AN OCCASIONAL CORRESPONDENT.)

PASTEURISATION UPHELD.

THE tendency to question the full nutritional value of pasteurised as compared with raw milk, shown in Prof. Stenhouse Williams's letter to your columns,[1] is evident also in this country but has not received official encouragement. The conference of State and Provincial Health Authorities of North America, which met recently in Washington, heard a report from its committee on milk, which roundly affirms the continued belief of health authorities in America that pasteurisation has no significant deleterious effect upon the nutritional value of milk. In the first place the report of the committee on milk production and control of the White House conference is endorsed as being the result of "an extended study and investigation of all phases of milk in its relation to the public health." The latter report states[2]:—

> Health authorities should recommend to American milk consumers that the general market milk be pasteurised before it is consumed, either in a properly supervised pasteurisation plant or at home.

The health officers' committee then proceeds to take up two recently published papers which appear to discredit pasteurisation and to criticise them in detail. The second of these papers is the article by Mattick and Golding, published in your columns on March 21st (p. 662). The committee states that these authors' conclusions are not justified by the experimental results, the difference in weight gained between the animals fed with heated and raw milk being, in its opinion, too small to be significant. The committee then presents abstracts of research, including that reported by Dr. Janet E. Lane-Claypon to the Local Government Board, which seems to show that heating milk does not destroy its nutritive value. The committee is anxious that further research of an authoritative character be undertaken, especially upon the effects of feeding raw and pasteurised milk respectively to young of the human species. It seems that during last year 39 epidemics in North America were traced to milk-borne infection. Only one of these was attributable to pasteurised milk, the milk in this case having been infected by a carrier after pasteurisation.

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[1] THE LANCET, May 30th, p. 1211.

[2] White House Conference (1930). New York: The Century Co., 1931, p. 129.

NEW YORK MUST BURN ITS GARBAGE.

For many years New York City has disposed of its garbage by loading it into scows which are then towed out to sea and the garbage dumped some forty miles from the shore. Even so it is not wholly lost, and New Jersey's coastal resorts have suffered by the drift borne upon them by shoreward winds and tide. The State of New Jersey summoned the City of New York before the Supreme Court. The defence of the city was a plea that the garbage was being dumped beyond the three-mile limit. This defence was set aside by the court as "of no importance." The court has now ruled that New York must stop dumping garbage at sea within a "reasonable time." Plans are being pushed forward for the building of 15 new garbage incinerators at an estimated cost of over 17 million dollars. The cost of incinerating garbage in this country varies from 26 cents per ton at Florence, S.C., to 5 dollars per ton at Providence, R.I. The cost of dumping garbage at sea has been only 23 cents per ton.

THE COFFEY-HUMBER CANCER CURE.

Not long ago Dr. W. B. Coffey and Dr. J. D. Humber were presented by a wealthy New York lady with an estate on Long Island whereon to erect a cancer research laboratory. The New York Board of Social Welfare has given them permission to have a laboratory there on condition that they treat no patients with adrenal cortex extract. The Californian doctors are apparently not satisfied to have a laboratory on these terms. Their lawyer is expected to ask the Welfare Board for a new hearing.

CORRESPONDENCE

A MATERNITY SERVICE.

To the Editor of THE LANCET.

SIR,—On reading the letter of Prof. F. J. Browne (p. 1422) one wonders where he gained his comprehensive knowledge of municipal hospitals. As one responsible for the work of a municipal general hospital, in which the council proposes to build a new and enlarged maternity department to replace the existing one, I must feel an object of attack by Prof. Browne. I do not regard the policy of the council as "utterly reactionary" but, on the contrary, as an important step towards safer midwifery. On the present staff "really trained and efficient people" are available, grading down from the visiting obstetrician—a university clinical lecturer and a Fellow of the Royal College of Surgeons, England—who is in complete clinical charge; through the senior resident obstetrician—a Fellow of the Royal College of Surgeons, Edinburgh—who, prior to his appointment had been for over two years senior resident and obstetric tutor in a teaching maternity hospital; to the ordinary resident medical staff, who come to the maternity department after periods in the medical and surgical wards. The staff carries on a tradition of successful midwifery of many years' duration. In 1930 there were 1453 confinements.

The teaching of midwifery is not perfect. One dislikes to use the tu-quoque in controversy, but sometimes it is argument. Has Prof. Browne never known of the appointment to the honorary staff of a voluntary hospital of a man or woman who has never filled a resident position in a maternity hospital, and is it not significant that Dr. Bethel Solomons should think it necessary[1] to warn the general practitioner that when he wants a consultant on midwifery he should find out if the latter is really a practising obstetrician? The attempt to divide doctors into "municipal" and "voluntary" is rather ridiculous. All doctors have worked at some time in voluntary hospitals, and most of them are willing to accept service under a municipality. One type of hospital does not command a monopoly of expert knowledge and skill.

We seem to be quite agreed that the proper place for a maternity hospital is in a department of a general hospital. No doubt we shall continue to differ on the question as to whether it is to be under municipal or voluntary management. This point will probably be decided by local conditions. I am confident that under municipal control there will be no difficulty in securing an efficient staff, and that this staff will be willing and able to do its part in the training of future consultants as well as of general practitioners.

I am, Sir, yours faithfully,

HENRY H. MACWILLIAM,

Medical Officer, Walton Hospital, Liverpool.

June 29th, 1931.

FATIGUE IN THE CINEMA.

To the Editor of THE LANCET.

SIR,—With reference to Mr. Savin's article on this subject in your last issue (p. 1433), in my experience the chief discomfort has been due to the relative lighting in the stage and auditorium. When the auditorium is very dark many suffer with headaches and discomfort, which is entirely removed when the auditorium is better lighted. The same can be noted in a card-room. When the room is lighted by lamps over each small table many will complain of headaches, which cease when a large central light is used as well. In both these cases the trouble is caused by defective stimulation of the periphery of the retina.

I was consulted by a patient who had been mountaineering for a month in Switzerland. On returning to his office he found that he had the greatest difficulty in reading, though he concentrated the light upon his work. He was completely cured on being told to have the remainder of the room as brightly illuminated as possible.

There is no evidence that the rods are percipient elements, but all the facts point to the conclusion that they are the nerve elements regulating the sensitiveness of the photo-chemical film.

I am, Sir, yours faithfully,

F. W. EDRIDGE-GREEN.

Board of Trade, June 27th, 1931.

SYPHILIS AND YAWS.

To the Editor of THE LANCET.

SIR,—Space would not permit me to give the entire "dozen ways" of showing the ancient European ancestry of syphilis. I will refer to one direct and one indirect method of proof.

A. Corn. Celsus (30 B.C.–A.D. 38), Lib. VI., XVIII., 2, speaking of the genital organs and specifically of phimosis, says, in part, "after overcoming the resistance of the prepuce" (one may almost sense the reduction en bloc) "there are seen ulcers that are situated upon the glans, or the prepuce, or on the penis beyond the glans, some of these are clean and dry while others are moist and purulent." Now the only common ulcers of the genitals that are clean and dry are Hunterian chancres, and the only ones that are moist and purulent are chancroids and mixed infections. (See E. Lancereaux "A Treatise on Syphilis," vol. i., p. 13.)

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[1] See THE LANCET, June 27th, p. 1384.

Knowing that the Greeks called what we name flat condylomata by their word for fig, σῦκον, and that the Romans simply translated this into *their* word for fig, "ficus," and used it for the same lesions, we turn now to the same Roman author, Celsus, Lib. VI., III., and, admitting that none of the ancients knew the connexion between genital lesions and constitutional disease, may read with understanding the author's words on sycosis. "There are also ulcers similar to fici called by the Greeks σύκωσις. The flesh overgrows: this indeed is usual. Under this are two varieties. One ulcer is hard and round; the other moist and irregular. From the hard one a sticky material exudes: from the moist more and of a bad odour. Both may be in those parts covered by hair but the hard round variety usually comes on the beard, the moist generally on the scalp." There is much more here than barber's itch and kerion Celsi. The fact that the author uses to describe these face lesions the same term "fici" as was in general use at that time to define condylomata between the nates shows that he was describing a condition quite well known to "us tropical frambœsiologists." In this connexion see "The Epigrams of Martial" (Lib. VII., 71), in which the author pokes fun at his victim with a play upon the word "ficus." Martial (43–104) was a layman and not bound by the medical ethics of his day.

Now for the item of inductive proof. At the present time it is recognised that aneurysm requires for its production the special type of mesarteritis produced by *Treponema pallidum* alone. This applies to arteries with lumina no greater than 1 mm. in diameter. Ligation for aneurysm has been a common practice since the time of Galen (131–201). Garrison in his admirable "History of Medicine," fourth edition, page 109, says in connexion with ligatures for this and other surgical purposes that there was a special shop on the Via Sacra where they were to be bought. Antyllus, a contemporary of Galen, perfected a technique for the ligation of aneurysm which held the field down to the time of John Hunter (1786). Da Costa recommends the Antyllus method for certain aneurysms even at the present time.

Now if the Romans showed enough aneurysms to make it possible for surgeons to develop such a worthy technique of cure as that of Dr. Antyllus it seems reasonable to think that *Treponema pallidum* was getting into their blood *somehow*, and it is our firm belief that it was through the "clean dry genital ulcers" described by Celsus.

I am, Sir, yours faithfully,
C. S. BUTLER,
Washington, D.C., June 4th, 1931. Capt. (M.C.), U.S. Navy.

To the Editor of THE LANCET.

SIR,—It must be obvious that there is little to be gained by further correspondence upon this subject; the problem is too big a one to thrash out in these columns. Any reader of THE LANCET who has the time and opportunity of studying the literature of the subject *and* the diseases themselves, with care in interpreting the terms used and in deciphering the sequence of manifestations, and with due regard to the sources whence the older writers derived their information and to the general trend of medical opinion of their times, must form his own opinion. He may find himself unable to come to a definite conclusion in regard to the relationship of yaws and syphilis, but I have little doubt he will agree with me that sibbens (and other outbreaks of disease mentioned by me in a previous letter) was certainly not yaws, but was epidemic, for the most part non-venereal syphilis, not always non-sexually acquired as Dr. Burke asserts.

I must, however, allude to a previous letter by Captain Butler to correct a statement which he makes in regard to my criticism of Lancereaux, an eminent syphilologist who had never seen yaws. I had said "Lancereaux was not even aware that *pian* and *yaws* referred to the same lesion." Lancereaux's words are: "There afterwards appear in different parts of the body, in pian little red pimples, in yaws papules and pustules, which soon became covered with uneven crusts beneath which are more or less extensive ulcers"—thereby distinguishing wrongly, pian from yaws, though grouping them together as belonging to the domain of syphilis, this idea being based upon the garbled accounts of frambœsia he had received and the false belief that the disease was transmitted hereditarily. I suggested that Captain Butler had been unhappy in the sources of his inspiration in regard to yaws. Later he has cited Huxham, Sydenham, and Buchan as "aware that yaws was simply non-venereal syphilis." Does Captain Butler really subscribe to such a view? Has anyone in this country seen an extra-genital chancre followed by a typical eruption of yaws? May I take this opportunity of asking any of your readers who has at any time under his observation a case of syphilis exhibiting what has been termed a frambœsiform syphilide, to give me the opportunity of seeing the case.

Captain Butler has also been unfortunate in following Jonathan Hutchinson in his opinion in regard to the case reported in THE LANCET thirty years ago. Hutchinson was guilty in just the same way as older syphilologists, as was pointed out by Patrick Manson in the discussion. I think I might go further and suggest that Captain Butler appears to have been equally unfortunate in his clinical material. In a recent paper (International Clinics, 1930, vol. ii.), he figures a Javanese child exhibiting (let me say for the benefit of those unacquainted with yaws) the *common* absolutely typical eruption of frambœsia; but his own note about the case reads: "This is what is called for by text-books in their definition of yaws, but is rarely seen." If Captain Butler will study the disease in Africa or the Dutch East Indies he will be surprised to see the disease, apparently unfamiliar to him, as recognised and described by clinicians as a clinical entity, whatever its relationship to syphilis may prove to be in the future. He will then understand why I suggested that the "dualists" would have good reason in throwing the onus of proving them wrong upon Captain Butler, a suggestion which appears to have caused him pain.

I am, Sir, yours faithfully,
Wimpole-street, W., July 1st, 1931. HUGH S. STANNUS.

ACUTE RHEUMATISM FOLLOWING TONSILLITIS.

To the Editor of THE LANCET.

SIR,—I have read with especial interest Dr. Sheldon's paper in your issue of June 20th (p. 1337). It is of enhanced value in that the observations were all made on children already in hospital and who were therefore under close supervision the whole time.

The conclusions agree very closely with those of previous workers. A point of great interest is the so-called silent period between the previous sore-throat and the subsequent attack of rheumatism. This was first pointed out in your columns [1] by Dr. J. M. H. Campbell and myself, when we found the period to be 5 to 25 days, the majority falling 7 to 14 days after the initial tonsillitis. This has been confirmed by Dr. B. Schlesinger [2] who demonstrated a period of 10 to 21 days, and now by Dr. Sheldon who found a period of 9 to 25 days. The period seems to me to be of very great importance as it bears largely on the ætiology of rheumatism. Dr. Sheldon and Dr. Schlesinger believe this is a period of sensitisation, and to quote Dr. Schlesinger's words "the rheumatic patient is in a hypersensitive state from the tenth to the twenty-first day after the antigenic throat infection, at any time during which a reaction in the form of acute rheumatism is liable to occur," comparable to the sensitisation produced by a dose of serum with its subsequent fever, rashes, and joint pains. Dr. Sheldon now goes a stage further and states "that the rheumatic reaction, whether arthritic or cardiac, has no more claim to be considered infectious than has, for example, post-diphtheritic paralysis." I am sure this is an unwarranted conclusion. A patient with no previous heart disease, or with old quiescent disease, develops a severe carditis 9 to 25 days after tonsillitis, as Dr. Sheldon himself admits. Surely he does not suggest that this is not of infectious nature. There is no evidence of this type of reaction after serum, and anyone who has seen the vegetations on the heart valves and compared them with subacute bacterial endocarditis cannot fail to see the resemblance between the two.

This same silent period can occur after other infectious diseases of childhood. Dr. Schlesinger found a similar silent period between the initial sore-throat of scarlet fever and the onset of scarlatinal rheumatism, and in our original paper we quoted cases of rheumatism following after a silent period, after scarlet fever (five cases), pneumonia (five cases), chicken-pox (two cases), measles (three cases), &c. In other words, rheumatism can occur after any illness liable to produce a state of lowered resistance in the child; and tonsillitis is one of the commonest and most neglected causes of this. In this connexion the work of Dr. A. Osman on scarlatinal nephritis seems of particular value. Working with Dr. Close, he has shown[3] that after an attack of scarlet fever there is a lowered alkali reserve in the blood which reaches its lowest limit on the twentieth day after the initial sore-throat, that is at the same time that scarlatinal nephritis sets in. It appears that in cases in which this fall in alkali reserve is small the nephritis is absent, and if it be prevented by giving enough alkali, the incidence falls from 4·7 per cent. to 0·4 per cent. There is also a fall in alkali reserve following tonsillitis, although this factor does not seem to be of especial importance in rheumatism.

I am sure that if we can obtain an insight into the biochemical factors associated with the lowered resistance of the patient during this silent period, we should go a long way towards preventing the onset of rheumatism. Probably the present system of treating a patient with tonsillitis by keeping him away from school for only two to three days contributes to the onset of acute rheumatism and any rheumatic patient who develops tonsillitis should be considered a sick person for at least three weeks.

I am, Sir, yours faithfully,

E. C. WARNER.

Devonshire-place, W., June 20th, 1931.

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[1] THE LANCET, 1930, i., 61.

[2] Arch. Dis. Child., 1930, v., 411.

[3] Guy's Hosp. Rep., 1929, lxxix., 14.

PARLIAMENTARY INTELLIGENCE

NOTES ON CURRENT TOPICS.

HEALTH SERVICES IN SCOTLAND.

ON Thursday, June 25th, the House of Commons went into Committee of Supply on the Scottish Estimates. Sir R. YOUNG, Chairman of Committees, was in the chair.

Government's Statement.

On a vote of £1,607,203 for the salaries and expenses of the Department of Health for Scotland, Mr. W. ADAMSON (Secretary of State for Scotland) said the largest item in the estimates was that for housing, which was 65 per cent. of the total. Since the State subsidy was introduced in 1919 a total of 121,019 houses had been built with State assistance up to May 31st this year. The shortage of houses still remained somewhere about 100,000, so that they had a long way to make up before the people of Scotland could be said to be reasonably housed. Ever since the present Government came into office a steady endeavour had been made to stimulate local authorities to renewed housing activity, and to restore the confidence which had been destroyed by the action of the late Government in reducing the State subsidy. Those efforts were now meeting with some measure of success, but no one could rest satisfied with the present situation. Representatives of the local authorities had been interviewed with the object of securing further progress, but unfortunately a number of local authorities had failed to appreciate the need for improved housing, even when in some cases it had been urged upon them by their officials. Parliament had vested the Central Department with power to step in where a local authority failed to do its duty, and it was well for him to speak frankly on this matter. He had given definite instructions to the Department that further pressure was to be applied, and, if necessary, compulsory action taken against the defaulting local authorities. If the 47 local authorities who had not yet submitted statements under the Act of 1930 made provision adequate to the needs in their areas he thought they could look forward to an average of something like 20,000 houses a year for the next three years. This would make a very substantial contribution to the rehousing of the Scottish people.

DROP IN SICKNESS BENEFIT.

The outstanding fact about the work of the National Health Insurance Scheme during 1930 was perhaps the drop in payments for sickness and disablement benefit. The amount paid out by the approved societies was less per member than in any year since 1925. The continued unemployment, which was affecting the income of approved societies from contributions, affected the relief coming from reduced expenditure on sickness benefits. In any effort to stop leakage of funds the utmost care must be taken that sick persons got the benefit to which they were entitled, and that they were also provided with the medical advice and attendance that they required at the proper stage. During 1930 some new forms of medical records were introduced and a system by which the Department would receive details of all sickness among insured persons. Sufficient time had not elapsed in which to compile complete results which would justify some generalisation. The preliminary reports which had been published in the annual report of the Department were merely tentative and should be read as no more than samples of the kind of information and sickness statistics that the Department would be able to furnish once this new scheme was in complete working order.

THE CHANGE OVER.

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Another subject to which the Government were devoting special attention was the development of an adequate hospital service in respect of beds, buildings, and quality of service. It was an urgent problem, and now that the local authorities had had a year since they took over the duties of parish councils, and were invested with the new powers conferred upon them, they would be expected to go forward with a policy which would at least end the old and inexcusable differentiations between the standard of treatment in poor-law hospitals and that in, say, fever hospitals, or in the ordinary voluntary general hospitals. There should be only one hospital standard which would be open to all. The estimate for investigations concerning the causes of diseases had been increased this year from £100 to £2500. It was intended that the scientific advisory committee would guide these investigations, and he looked for a large return from this proposed small expenditure. There were some people—and they were particularly vocal at present—who criticised the social services and spoke and wrote glibly of cutting them down, but he thought that the condition of the country would be wretched indeed if it could not maintain the services for which these estimates provided and which were fundamentally necessary in a civilised State.

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The report of the Department of Health stated that these cases might be prevented if doctors, midwives, and maternity nurses were to make a wider use of masks and adopt more careful antiseptic treatment for the hands. It was also suggested that in hospitals there should be bed isolation by means of metal and glass screens. If the statistics of maternal mortality were classified into smaller groups they would be able to note the number of deaths in institutions, the number of deaths in the patients' homes attended by a nurse or by a doctor, and the number, where patients were nursed in their own homes, attended by a midwife. That would give them some idea where the poison came from. A country doctor had informed him recently that he found that fever cases went wrong in the cottages than in nursing homes. It was his opinion that the septic germ was not in the cottages but in the nursing homes, and that there was more likelihood of the germ being passed from one patient to another in institutions and nursing homes than in cottages where there were clean and healthy conditions, and the germ did not exist. He thought there was a large amount of reason in that. In the matter of medical attention the new Local Government Act was extraordinarily useful, because it coördinated all the medical services from birth until the child was of school age. Something more, however, might be done in looking after the children between the ages of 1 and 5 years, because the report stated that children were fairly well looked after up to one year.

HARDSHIP IN THE HIGHLANDS.

Mr. MACPHERSON said in the rural parts of Scotland the population was very sparse and often a doctor lived 20 to 25 miles from some of his patients. He asked whether the Department of Health was assisting or intended to assist the sparsely populated localities, where it was difficult to get the minimum number of telephone subscribers, to get a telephone service installed so that the poorest people might be brought into quick touch with a doctor. He had had case after case brought to his notice of a patient dying, or being driven almost to the point of death, because it took half a day to get into touch with a doctor. The local medical practitioner in the Highlands was very often a man of great skill in medicine and in surgery. In his tours through the Highlands he often went into doctors' houses, and he found that what was specially needed was a small additional room where patients might wait, or which, in an emergency, might be used even for a slight operation. If the Secretary of State would consult his medical advisers they would agree that an extra room of this kind in the doctor's house was greatly needed.

Mr. MACQUISTEN supported Mr. Macpherson's plea for greater telephone facilities throughout the Highlands and Islands of Scotland. He wished that the Secretary of State would impress on his medical officers the need for preventive methods. The dental deterioration in the younger generation to-day was entirely due to unsuitable foods and the sophisticated. devitalised and preserved stuff which the people now ate.

Mr. McGOVERN said Mr. Macquisten had mentioned the great amount of ill-health due to tinned foods and white bread. The real trouble, however, was that the people were often not able to consume any decent food whatever. Bad housing and overcrowding, especially in the industrial areas, was one of the greatest factors together with malnutrition contributing to ill-health among the population of Scotland. If they were going to improve the health of the people in the slums, the rents of the new houses must be the same as those from which the slum-dwellers were taken.

DEPRESSION IN TRADE.

Major ELLIOT said they found from the report of the Department that a section taken out of the 1,850,000 insured persons in Scotland showed a lower morbidity-rate this year than in previous years, and that was a matter upon which they ought to congratulate themselves. One of the important factors in this connexion had been the absence of an influenza epidemic such as those which had repeatedly occurred in previous years. That was one of the important reasons for the drop in the payments of sickness benefit. The tuberculosis returns were one of the most obvious ways of telling whether the public health was good or bad, and the figures had fallen to a point never touched before. Infantile mortality had also fallen to a point never reached before. The special inquiry by the Department of Health into the health of the children of unemployed persons showed that they were not suffering. Indeed, the health of the people of Scotland was being maintained remarkably well. But the lesson of this report was that depression in trade and industry were the things that were really holding back the country from the progress which they desired it to make.

Government's Reply.

Mr. WESTWOOD (Under Secretary of State for Scotland), replying to the debate, said that Dr. Smith, of the Aberdeen Health Department, had been awarded the Nichols Prize of the Royal Society of Medicine, which was given every three years, and he had given the Government very valuable assistance in connexion with medical research. With regard to enteric fever and diphtheria the investigations of the Department of Health had shown, unfortunately, that it was most difficult to trace the source of infection, but they were continuing their investigations. If there were any particular cases of lack of telephone facilities in sparsely populated areas to which Mr. Macpherson desired to draw particular attention they would be inquired into and, if it was possible, assistance would be given. The question of an additional room in doctors' houses seemed to be quite worthy of consideration, and would be looked into by the Department.

CARE OF MATERNITY.

The Duchess of ATHOLL drew attention to a matter which was insufficiently emphasised in the report—namely, the extension of the maternity and child-welfare schemes in the rural areas. There might be many reasons for maternal mortality, but all medical opinion was agreed that one of the chief reasons was the want of more antenatal care. The presence in these districts of nurse health visitors would be a very important factor. The report brought out the need for antenatal care from the point of view of the health of the newly born child. Only one-third of the mothers of Scotland received antenatal care, and that was not at all a satisfactory position. One of the first things to be done for health in Scotland was to ensure that every county possessed a district nursing association.

Miss LEE said she was very troubled by the following statement which she found in the report of the Department of Health: "Maternity homes are intended for normal confinements but, owing to the shortage of maternity hospital accommodation, they have been used to some extent for abnormal cases, for which, however, they are neither adequately equipped nor staffed." She felt bound to bring this point again before the Committee, because women in her own constituency had complained that there was a scarcity of hospital places in the west of Scotland for abnormal cases where there were particular medical difficulties present. She thanked the Secretary of State for the work he had done for nurses. She had brought to the right hon. gentleman's notice cases where nurses in public institutions were being underfed and certainly overworked. She begged that the good work which the right hon. gentleman had begun in this matter should be continued. There was great need for its continuance because she was far from satisfied with the condition of things in the voluntary hospitals.

The vote was withdrawn.

sickness among insured persons. Sufficient time had not elapsed in which to compile complete results which would justify some generalisation. The preliminary reports which had been published in the annual report of the Department were merely tentative and should be read as no more than samples of the kind of information and sickness statistics that the Department would be able to furnish once this new scheme was in complete working order.

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Small-pox in India.

Mr. FREEMAN asked the Secretary for India the number of deaths from small-pox which had occurred each year in Calcutta, Bombay, and Madras respectively since the year 1924.—Mr. WEDGWOOD BENN replied: The following table gives the figures of small-pox deaths for which my hon. friend asks:—

Town or municipality.	1924	1925	1926	1927	1928	1929	1930*
Calcutta	316	3,923	934	2,860	558	393	1,831
Bombay	1,231	565	476	841	595	1,126	1,562
Madras	196	762	60	32	246	503	181

* Provisional figures.

TUESDAY, JUNE 30TH.

Foo-supply at Shieldhall Fever Hospital.

Mr. MCKINLAY asked the Secretary for Scotland, if he was aware that patients from the Partick district of Glasgow, until recently inmates of Shieldhall fever hospital, had complained of the food supplied and that the wards were infested with vermin; and what steps he proposed to take to have the matter rectified.—Mr. WESTWOOD (Under-Secretary for Scotland) replied: I have no knowledge of complaints by patients who have recently been in Shieldhall Infectious Diseases Hospital in regard to the food supplied, which is drawn from the same sources as that supplied to other institutions under the Public Health Department of Glasgow. As regards infestation of the wards with vermin, I am informed that certain portions of the hospital have for some time been invaded by small red ants, which established themselves in the kitchen and along the ducts of certain of the wards. Substantial repairs to the kitchen have resulted in their disappearance from that area, but up till now efforts to eradicate them from the ducts of the wards have not been so successful. It is hoped, however, that further improvement will be effected by measures which are being taken under the direction of a medical officer who has had special experience in connexion with insect pests.

Workmen's Compensation in Mauritius.

Mr. MCSHANE asked the Under-Secretary for the Colonies the reasons why, in Mauritius, the Workmen's Accident Compensation Act, although it had received the Royal Assent, had not yet been put into operation.—Dr. SHIELS replied: The position as regards the Workmen's Compensation Bill in Mauritius is that its consideration was deferred during the final session of the last Council of Government for various local reasons. The Bill was reintroduced at the opening of the new Council in May, and is now awaiting its second reading, the discussion on which was expected to take place to-day.

MEDICAL NEWS

University of Cambridge.

At recent examinations the following candidates were successful:—

THIRD EXAMINATION FOR M.B. & B.CHIR.

Part I., Surgery, Midwifery, and Gynæcology.—R. J. V. Battle, H. E. Blake, E. Bradbury, A. B. Carter, G. T. Cook, A. H. Dunkerley, K. V. Earle, G. R. Ellis, C. D. Evans, C. L. Ferguson, T. C. Gipson, D. R. Goodfellow, H. F. Green, G. W. Hall-Smith, A. S. Herington, J. Howell, J. Hughes, J. T. Irving, N. M. James, L. P. Jameson Evans, R. A. Jones, A. W. Langford, A. Lister, B. F. Longbotham, J. V. Lucas, G. C. Martin, F. C. Mayo, D. A. Metcalf, A. K. Monro, J. G. More Nisbett, G. G. Mowat, R. W. C. Murray, W. H. Mylechreest, C. R. L'E. Orme, J. L. Parker, G. T. Partridge, C. G. Roberts, I. C. Robertson, E. Sharp, N. Stevens, R. A. Sykes, J. E. J. Thomas, G. M. Tickler, A. B. Waters, M. Westwood, C. E. R. Wood, and A. H. Zair.

Part II., Physics, Pathology, and Pharmacology.—C. P. Bailey, G. N. Bailey, J. S. Barker, L. T. Bond, C. C. Bryson, H. S. Buckland, G. F. Carey, A. B. Carter, C. L. Collins, G. T. Cook, J. H. Cyriax, A. Eckford, W. A. Fell, D. R. Goodfellow, F. T. J. Hobday, J. T. Irving, G. D. Kersley, C. R. T. Lane, D. L. Lewis, J. W. S. H. Lindahl, G. G. Ludgater, E. H. W. Lyle, D. B. McGavin, J. M. Matthew, C. W. Morley, W. M. Niblock, R. G. Orr, J. L. Parker, J. Petro, W. H. Poole, H. E. W. Roberton, M. H. Salaman, G. H. Sanderson, W. W. Sargant, P. G. Scott, J. Sowerbutts, J. H. Spence, T. C. Stamp, E. T. W. Starkie, H. C. Stewart, J. W. Summerhayes, A. W. Vaisey, J. G. Vincent Smith, E. D. Ward, G. W. Whittall, L. K. Wills, T. D. G. Wilson, C. H. Wrigley, and R. H. Young.

Hospital of St. John of Jerusalem.

The King has sanctioned the following promotions in and appointments to the Venerable Order of the Hospital of St. John of Jerusalem:—Knight of Justice: Col. Sir James Purves-Stewart. Knight of Grace: Col. the Hon. Murray MacLaren. Commanders: Maj. Sir Thomas Houston, Dr. E. A. Chill, Sir P. Horton-Smith Hartley, Lt.-Col. H. J. Barnes, Dr. R. Clegg, Dr. F. N. Kay Menzies, Surg.-Vice Admiral Sir Arthur Gaskell, and the Hon. J. H. King, M.P. Officers: Lt.-Col. G. E. Peacock, Lt.-Col. G. Mackie, Capt. A. C. W. Knox, Dr. W. E. Thompson, Dr. A. Wilson, and Sir Squire Sprigge. Serving Brothers: Dr. W. Lee, Dr. L. A. Line, Dr. F. S. Booth, Dr. L. Featherstone, Dr. C. A. Verco, Dr. W. G. Shellshear, Dr. W. B. A. Moore, Dr. D. H. Griffiths, Dr. R. L. E. Downer, and Lt.-Col. G. C. E. Simpson. Associate Serving Brothers: Major Sorab Kaikhosru, Engineer, and Dhanjibhai Hormasji Mehta.

International Association for Preventive Pædiatrics.

The first meeting of this association will be held at The Hague on Sept. 7th and 8th, 1931. The subjects for discussion are to be Return Cases of Scarlet Fever and the Mortality in the First Ten Days of Life. Information about the meeting can be obtained from the secretary, Prof. G. Scheltema, 14A, Poelstraat, Groningen, Holland.

Medical Society of Individual Psychology.

A dinner of the Society will be held at the Florence Restaurant, London, W.1, on July 9th, at 7.15 for 7.30 P.M. (morning dress), and will be followed by the General Meeting.

London Jewish Hospital Medical Society.

The annual general meeting of the Society took place on June 25th, the President, Dr. L. Mandel, being in the chair. The following officers were elected for the session 1931–32:—President: Mr. M. Sorsby. Vice-President: Dr. L. Turiansky. Treasurer: Dr. Hannah Billig. Hon. Clinical Secretary: Dr. H. Avery. Hon. General Secretary: Dr. L. Phillips. Committee: Dr. Leah Appell, Dr. Borst, Dr. D. Krestin, Mr. S. I. Levy, Dr. M. Marcus, Dr. Fanny Robinowiz, Dr. M. Tree, Dr. A. D. Woolf. A vote of thanks to the outgoing President was proposed by Dr. Phillips and seconded by Dr. Schwarzman.

John Mallet Purser Lecture.

The first lecture was delivered in the School of Physic, Trinity College, Dublin, on June 26th, by Sir Edward Sharpey-Schafer, F.R.S., on the New Physiology. The chair was taken by Sir Almroth Wright, F.R.S., who had been admitted on the previous day the first Honorary Fellow of Trinity College. The lectureship was founded last year by Miss Jane Purser in memory of her brother, the late John Mallet Purser, who was King's professor of the Institute of Medicine in the School of Physic from 1874 to 1901, and Regius Professor of Physic in the University of Dublin from 1917 to 1925. Sir Almroth Wright had been one of his pupils. As King's professor Purser was the first teacher in Ireland to give systematic instruction in physiology and pathology.

Springfield Nurses' Home.

Last week Princess Mary opened the new nurses' home at Springfield Mental Hospital, Upper Tooting. The hospital now accommodates 1400 patients, and the new home is designed to house 140 nurses. The Princess also opened the new premises of the Wandsworth and Tooting Children's Clinic at Lower Tooting.

St. Thomas's Hospital Out of Debt.

For the first time since the war St. Thomas's Hospital is free of debt owing to donations of £104,000 from Sir William Morris and £100,000 from Lady Houston. As a mark of appreciation the portraits of these two donors have been hung in the hospital.

General Lying-in Hospital.

The annual report shows that in 1930 this institution in York-road, Lambeth, received 1068 in-patients, an increase of 53, and that 1165 women were attended and delivered at home, an increase of 65. There was one maternal death, for which the post-mortem failed to show any cause.

OBITUARY

DUDLEY WILMOT BUXTON, M.D., B.S.Lond., M.R.C.P.Lond.,

CONSULTING ANÆSTHETIST, UNIVERSITY COLLEGE HOSPITAL.

We regret to announce the death of Dr. Dudley Buxton, the well-known authority on anæsthetics, which occurred on Sunday last, June 28th, in a nursing home on his seventy-sixth birthday.

DR. DUDLEY BUXTON.

Dudley Wilmot Buxton was born in 1855, the son of Mr. Harry Wilmot Buxton, a barrister-at-law of the Middle Temple. He received his general education at private schools, and University College, London, and his medical training at University College Hospital. He entered the hospital in 1878 and was a successful student, qualifying as M.R.C.S. three years later and taking the M.B. and B.S. London in 1882 with honours in each instance. He served as house physician and house surgeon at his hospital and proceeded to the M.D. degree in 1883 and took the M.R.C.P.Lond. in the following year. Before deciding on the career of a specialist he leant towards general medicine and was appointed by Sydney Ringer, then Professor of Medicine in the College, to be his assistant. Ringer stimulated him to study the scientific aspect of medicine, and helped him in his early work, undertaking with him an inquiry into the effects of acids, alkalies, and cocaine on the heart. At this time Buxton edited the fourth edition of Waring's Therapeutics, and was elected physician to the Marylebone General Dispensary.

But in 1885 he decided to specialise in anæsthetics, a subject which 45 years ago was in its youth as an exact science. He obtained the post of anæsthetist at University College Hospital, giving his services also to the Hospital for Women in Soho-square, to the Royal Dental Hospital, and in particular to the National Hospital, Queen-square. With his marked attainments and with these large opportunities for their exhibition, he soon became recognised as a leading exponent of his branch of medicine. As a lecturer he was an indefatigable instructor, triumphing over difficulties of elocution, and his pupils at University College Hospital and the Royal Dental Hospital were equipped in a way that was quite unusual in British medical schools to undertake the responsiblity of administering anæsthetics when they entered upon practice. His ability in teaching his subject was recognised by those who came back to learn from him many years after qualification—in fact, his recognition of the importance of every doctor going into practice with a competent knowledge of anæsthetics affected the teaching of this subject throughout all the country. He wrote largely and instructively in numerous journals, publishing researches into the action of various anæsthetics, and one work of his on the uses and administration of the different agents passed through six editions. On nitrous oxide, ether, and chloroform alike his observations were valuable. At first they were founded on the physiological deductions from experimental work, but later on an enormous and delicate experience, when he was often aided by the scientific discrimination of his great friend Sir Victor Horsley. It is due to Buxton's work on nitrous oxide that continuous nitrous oxide gas is now administered. With regard to ether he felt that the gas-ether induction was a kinder method than the open ether induction, while his study of colonic ether interested him greatly from the outset; he held that there should be further investigation of this method, and consequently the recent introduction of avertin as an anæsthetic was of great interest to him.

Buxton, both from his range of knowledge and his practical opportunities, was an acceptable figure on any committee of inquiry into anæsthetics. He served as secretary of a Special Chloroform Committee appointed by the British Medical Association, was a member of the Departmental Inquiry into the giving of anæsthetics, and made a valuable contribution to our knowledge of chloroform in his addendum to the Hyderabad Commission on Chloroform. At this time Buxton was the advisor of THE LANCET upon the subject of anæsthetics; and his labours in connexion with the Hyderabad Commission, undertaken for us, were of a difficult character. In 1888 the Nizam of Hyderabad, at the instance of his residency surgeon, Surg.-Major E. Lawrie, instituted an inquiry into the action and effects of chloroform, Lawrie desiring to prove that the risks attached to its use were preventing the anæsthetic from being sufficiently or properly used. The report of the Nizam's committee of inquiry was forwarded to THE LANCET, when various comments upon the conclusions were made. As a result, THE LANCET was invited to send a representative to hold a further inquiry on the spot. Lauder Brunton was selected for the task and a second inquiry of an elaborate sort was undertaken under his direction, the expenses being defrayed by the Nizam. The results of that inquiry were published as a supplement to THE LANCET in 1893 under the editorship of Dr. Dudley Buxton, who summarised, with extreme care and ability, the voluminous records, and furnished a clinical addendum. During later years he wrote monographs for the *British Journal of Anæsthesia* on Clover, Snow, Lister, and others who had influenced the development of anæsthesia. Such articles as Anæsthesia: its Physical and Psychological Aspects, and Sleep and Her Twin Sister Death, are typical examples of his broad views. His well-known work "Anæsthetics," reached its sixth edition in 1920, by which time its size had been more than doubled in accord with the developments of exact knowledge. His position as one who had contributed notably to these developments is shown by the posts which he filled, for he was at one time President of the Society of Anæsthetists, at another, of the Section of Anæsthetics of the British Medical Association, while he was selected to be President of the Section of Anæsthetics at the International Medical Congress, held in London in 1913.

During the war Dudley Buxton was anæsthetist to King George V. Hospital, in addition to his other appointments, and shortly after the termination of the world struggle he retired from London, having felt the stress of his long and arduous professional life. For 40 years he had had a cottage in Hertfordshire, and later he built a house near Boxmoor to which he retired in 1919. He was made consulting anæsthetist to the three great institutions with which he had been connected, University College Hospital, the Royal Dental Hospital, and the National Hospital, Queen-square, while residence so near London enabled him to keep green his many friendships. He soon found the interest of the countryside and of gardening insufficient for him, and took his recreation in administering anæsthetics and teaching the nurses at the West Herts Hospital until impaired health prevented these activities. He thus may be said to have died in office. To the regrets of his personal friends will be added those of the very many professional colleagues who recognised in Buxton a pioneer as well as an enthusiastic worker in his important field of medicine.

In 1884 he married Louise, daughter of the Rev. Thomas Grey Clarke, by whom he had three sons; the eldest, Leonard, formerly a Beit scholar, is now lecturer in physical anthropology at the University of Oxford; the second son, St. John, is surgeon to King's College Hospital; and the third Leycester, is dental surgeon to University College Hospital

WILLIAM DARLING, M.B., F.R.C.S.Edin.

Dr. William Darling, who died on June 23rd at the age of 60, was a well-known Edinburgh practitioner, who came of a family of school teachers and was himself a trained and acting teacher before entering medicine. He graduated M.B., Ch.B., at Edinburgh in 1899, he held hospital appointments in Leith, Manchester, and London, and studied for a year at Marburg, obtaining later special qualifications in surgery and public health. His educational training brought him into contact with training college work and when courses in personal hygiene were first established at these colleges Dr. Darling was selected as lecturer. For 20 years or so students and school children passed under his medical scrutiny. He always took a keen interest in the work of the R.A.M.C., and had served in South Africa. On the outbreak of war in 1914 he was called up as a member of the special reserve and took part in the retreat from Le Cateau and Mons. He was in the first battle of the Marne, and later on the Aisne; he was twice mentioned in dispatches and was awarded the Military Cross for services on the Somme. He was finally gazetted out as Lieutenant-Colonel in the R.A.F. Medical Service, to conduct a large general practice until within a few weeks of his death. A colleague writes: "Dr. Darling had a multitude of friends both among the general public and the profession. As an inspiring officer he will be very badly missed; for he had given a lifetime to the training of young officers and to promoting the work in the special reserve. He many times assured me that he would not for the world be without the experience of the Mons retreat."

THE LATE BARON KITASATO.

LAST week we published a biographical notice of Prof. Shibasaburo Kitasato with an appreciation by his friend and pupil Prof. Mikinosuke Miyajima. We are indebted to Prof. W. Bulloch for some further details of the six years spent in Robert Koch's Institute. It was in 1885, Prof. Bulloch writes, that Kitasato was sent to Europe by the Japanese Government to study bacteriology and infectious diseases, and he settled in Berlin at the Hygienisches Institut under Robert Koch, who was then nearing the height of his fame. Koch had recently (1882) discovered the causes of tuberculosis and (1883) of cholera; and his Institute was a mecca to which students were flocking from all parts of the world. Kitasato stayed in Koch's Institute for six years (1885–1891), and was given the honorary title of Professor of the University of Berlin. He worked in a small room, and was always busy. He soon mastered the rigorous bacteriological technique imposed by Koch on his pupils, and about 1887 began to publish researches on cholera and typhoid bacilli and on anthrax. He discovered several new organisms, one with a remarkable musk odour, *Fusisporium moschatum*. In 1889 he cultivated in a pure state *Bacillus tetani*. He showed that it was an obligate anaerobe, and by the accurate study of its distribution in the body was led to infer—and he was the first to do so—that lockjaw is essentially an intoxication disease. The actual toxin of tetanus was discovered by Knud Faber, 1890. In that year Behring and Kitasato discovered tetanus antitoxin and laid the first foundations of serum therapy. The brief but classical research of Behring and Kitasato was published in the *Deutsche Medizinische Wochenschrift* of 4th December, 1890, and contained the main facts regarding tetanus antitoxin—its properties, its durability, its passive transference, and its specificity.

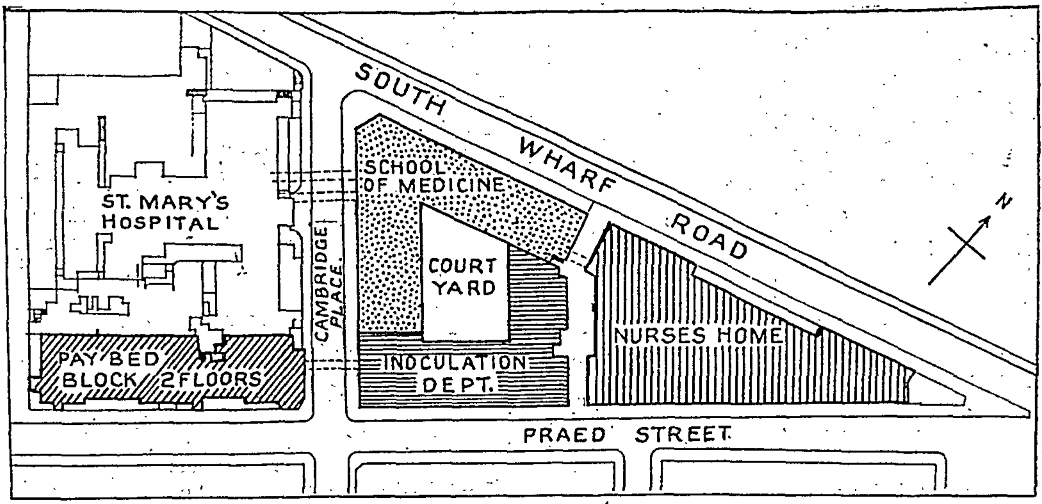
After his return to Japan in 1891, Kitasato founded the private bacteriological institute at Shirokane, across the bay from Tokyo city, which was first subsidised by and then taken over as a Government department under the name Imperial Japanese Institute for Infectious Diseases. Here, writes Prof. Bulloch, he created quite a Japanese School of Bacteriologists, amongst whom may be specially mentioned Kioshyi Shiga and S. Hata. In 1894, Kitasato was sent by his Government to Hong-Kong to investigate the nature of plague, which was occurring in epidemic form. This expedition resulted in his greatest discovery, *Bacillus pestis*. His work was done in record time. With Aoyama, the morbid anatomist, Kitasato landed at Hong-Kong on June 12th, 1894, and began his study on June 14th. In an autopsy he found numerous bacilli in the buboes and in the heart blood. He inoculated mice from the splenic blood, and on the same day also obtained blood from a living case of plague. Cultures were made, and all grew. They were inoculated into mice, guinea-pigs, rabbits, and pigeons. All died except the pigeons. He found the bacilli in fifteen cases of plague, and got out all the main facts of the bacteriology of bubonic plague. His first publication in English on plague appeared in the columns of THE LANCET (1894, ii., 428–430), and was a very complete piece of work.

A WAR MEMORIAL HOSPITAL.—Lady Violet Astor recently opened the Edenbridge and District War Memorial Hospital which takes the place of a house temporarily adapted in memory of men from the district who fell in the war. The building and equipment have cost £18,000. At the opening ceremony Mr. W. E. Tanner, the hon. consulting surgeon, said that the hospital was not surpassed in any part of the world, and that it was proposed to treat any kind of illness with the exception of infectious disease.

ST. MARY'S HOSPITAL, PADDINGTON.

FOUNDATION-STONE CEREMONY.

THE foundation-stones of the medical school and pathological institute of this hospital were laid on June 30th by H.R.H. the Duchess of York. The new buildings will occupy the island site between Praed-street, Cambridge-place, and South Wharf-road. The medical school will be in the north-west corner with administrative offices, common room, speech hall, and library on the ground floor; garage, cloak-room, billiard-room, swimming bath, and dining-room in the basement; and laboratories and classrooms above. The pathological institute will include laboratories, workrooms, animal rooms, and out-patients' department, and will be connected with the hospital by a bridge over Cambridge-place. The eastern angle of the site is reserved for a nurses' home.



Plan of the new building.

Lieut.-Colonel H. E. Verey (chairman of the hospital) welcomed the Duchess of York, and said that this was a great day for the hospital. The new premises would allow the provision of 30 more maternity beds in the old inoculation department, and he hoped it would not be long before the new nurses' home could be erected, making room for more maternity beds and for pay-beds. When the scheme was completed, the buildings would not fear comparison with those of any hospital in London. Nevertheless, it was not buildings that made a city but the spirit of the men that dwelt in it. The hospital had had a distinguished line of royal Presidents but had never been happier than in its present President, the Duchess of York.

Mr. Stanley Baldwin pointed out that less than a quarter of a century ago medical schools had been dependent on students' fees for their very existence. Now there were grants, but all capital expenditure, for buildings and research, still came from the public. This important fact was often forgotten by those who gave generously to hospitals. With the medical schools rested the training of future medical men, but nothing was done to help them to discharge that great obligation. As an example, he took the subject of maternal mortality, and the need for obstetric beds, training, and research. Extra maternity facilities should essentially be provided in hospitals with medical schools. The money available for the buildings being erected at St. Mary's had been principally the *gift of a few individuals* endowed with vision: Lord Revelstoke, Lord Iveagh, Lord Beaverbrook, and others, who were seeking the right way in which the heart and the head could combine in making a return for the generosity shown to them by life. The need must be brought to the notice of the general public. There was no field more fertile for human health and human happiness. Mr. Baldwin spoke warmly of the work of Sir Almroth Wright—a man in the true tradition of Jenner—and said that our country, which contained more latent talent than any other country in the world, might contain many potential Almroth Wrights. To find and endow this hidden talent was the great need, and this called for the endowment of scholarships. He prayed that the very rich might learn the superlative joy of giving, and that a due proportion of the exceptional men in the country, whatever their rank, might be led to join the great healing profession.

Dr. C. M. Wilson proposed, and Sir Almroth Wright seconded, a vote of thanks to Her Royal Highness. Dr. Wilson urged students to acquire a reverence for facts and a passion for exactitude, saying that these were the essential elements of Lord Revelstoke's mind. Research students must look on old problems from new angles, and see the world with the eager eyes of a child. Conventional thought, useful enough in its way, was a grave handicap in research. Medical education was the key to the health of the nation.

Sir Almroth Wright said that they were all out for this business of doing good; the question of reward fell right out of consideration. There was no reward for seeing or hearing or doing good. If the eye did not get pleasure from seeing or the limbs from moving, no amount of thanks would help them. Doing good was part of the vital energy of man that needed outlet. He especially mentioned his colleagues in the laboratories, Sir Max Bonn, Lord Iveagh, and Sir Edwin Cooper, the architect, who had designed an attractive home for their work.

The Duchess of York then laid the two foundation-stones with a mallet used by Queen Victoria, King Edward VII., and King George V. The Bishop of Kensington offered prayers of dedication.

The funds for the commencement of the new buildings have been derived from gifts of £63,000, £25,000, and £40,000 from Lord Beaverbrook, the estate of the late Lord Revelstoke, and the Earl of Iveagh respectively. The committee of the inoculation department has contributed £20,000, and other gifts total £10,000. To complete the programme a further sum of £350,000 is needed, and for this a public appeal is being made.

A STATISTICAL SURVEY OF SIERRA LEONE.

THE difficulties attending the composition of vital statistics in most of our tropical dependencies are almost insuperable. The desirability of such reliable statistics is acknowledged on all hands, and were it possible to obtain records in any way comparable with those compiled in the older civilised countries, it would aid the cause of development and ease the burden of administration. That more strenuous efforts should be made to supervise the public health figures in our African colonies has recently been urged by public health authorities, notably by Major Granville Edge.[1] But the obstacles are great; except in the larger centres of administration, neither the medical organisation nor the personnel is in existence, and furthermore native superstitions and customs discourage too intimate inquiry into their home affairs. Post-mortem examinations cannot be performed as a routine in native bush villages, even where prejudice does not forbid the practice altogether. Prof. D. B. Blacklock has tried to overcome some of these difficulties by a sampling survey of a selected population in Sierra Leone.[2] From November, 1927, the survey was continued, with interruptions, till October, 1929. A period of four and a half months was allocated to the Northern and a year to the Central and Southern Provinces.

The Northern Province.

In the Northern Province four journeys were undertaken, being the principal villages visited. The total number of persons examined was 4337—the majority being subjected to a complete, the remainder to a partial examination. In his report of the results obtained the diseases are arranged in alphabetical order. Some of them are of special interest in view of popular impressions on native immunity from certain diseases. Numerous cases of arthritis were encountered, 143 showing deformity and swelling of joints. Blood examination of 636 persons showed the percentage infected with malaria parasites to be very high—57 per cent. Films of blood taken at night revealed *Microfilaria bancrofti* in 15 per cent., and the day blood of 257 persons revealed *Microfilaria loa* in less than 1 per cent. *Microfilaria perstans* was demonstrated twice.

THE PREVALENCE OF SKIN DISEASES.

Skin diseases were widespread. Apart from the cutaneous lesions of leprosy and yaws, scabies, impetigo, and pyosis were common. Pellagra-like eruptions were present on the hands and feet. In view of recent findings in Central Africa it is satisfactory that no cases of lung disease due to the tubercle bacillus were noted. Several patients, however, showed suspicious emaciation and physical signs. Human trypanosomiases contributed very little to the catalogue of the diseases found in areas visited during this survey. No cases actually suffering from small-pox were encountered, though 261 who gave a history of previous small-pox had not been vaccinated, great dread being evinced of this trivial operation. Gangosa, or the repulsive mutilating rhinopharyngitis, appears to be common; no less than 64 cases were seen. It was noted too in four subjects under 10 years of age. Evidence was forthcoming that gangosa is an expression of a generalised disease. No less than 87 per cent. of those afflicted with gangosa gave a history of yaws, and thickenings of the large bones were frequently observed. Gonorrhœa appears to be alarmingly prevalent, the youngest sufferer from urethritis being a child in arms. Of a total of 732 males over 14 years of age, evidence of existing gonorrhœa was found in 304. Perineal fistula and scrotal sinuses were definitely associated with an active infection. No less than 408 persons were found affected with hernia or hydrocele, umbilical hernia being more than twice as common as all the other forms of hernia combined. It is much more frequent up to 10 years of age. The section on tumours is disappointing. Lipomata are said to be relatively common in natives of this part of the Protectorate, but though the presence of other tumours including one definite case of scirrhous carcinoma of the breast is noted, no indication is given of the incidence of simple or malignant tumours in the population surveyed. Yaws was very prevalent; the number of cases from the Bullom region far exceeded the number of cases of this disease seen in other areas visited. No person of over 50 years of age was found affected, but the proportion of young people under 10 years of age with yaws was overwhelming. In 26 per cent. the primary lesion occurred on the upper extremity; in 54 per cent. on the lower extremity; and in 7 per cent. on the head and neck. The people themselves welcome the treatment of yaws by injections, and according to Prof. Blacklock there is some evidence that its permanent cure of yaws can be brought about by a few injections of bismuth or arsenic.

The Southern Province.

The second part of his report concerns itself with the Central and Southern Provinces. The same routine was observed over one year, and the number of persons examined was greater, being 5153, of whom 3678 were males and 1475 females. The blood of 151 persons was examined for microfilaria and trypanosomes. In five, *Microfilaria bancrofti* were found, and in one specimen of blood, trypanosomes were present. Satisfactory evidence of the existence of typhoid and paratyphoid infections was obtained. Out of a total of 556 persons whose serum was examined, the number of positive reactions ws 61—namely, 28 with *B. typhosus*, 3 with *B. paratyphosus* A, and 30 with *B. paratyphosus* B. There appears to be little doubt that the typhoid group occurs sporadically in Sierra Leone, and that the illness which affected a number of girls in the Moyamba American Mission School in 1926 was of this nature. Elephantiasis appears to be as commonly distributed as in the Northern Provinces, 42 cases being noted. Disfiguring gangosa was not so widespread as in the Northern Provinces, but gonorrhœa appears to be even more prevalent than in the north, the incidence amongst the population being about 14 per cent. It is suggested that schools could do a great deal of valuable work in ascertaining more details about the distribution of physopsis. Schools should be provided with samples of snails and a record could be kept by the headmaster of such streams and swamps in which these snails were found by the children. Gonorrhœa is so prevalent and primary syphilis so rare in this community that it is concluded that some factor is at work which either does not permit *S. pallidum* to cause infection or prevents syphilitic sores of the genitals from assuming a characteristic form. Lesions affecting the soles of the feet were found, due to the aftermath of a previous yaws epidemic, while no less than 297 cases of fluid eruption of secondary yaws were seen.

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[1] See THE LANCET, March 14th, p. 599.

[2] Report on a Survey of Human Diseases in the Protectorate of Sierra Leone. By D. B. Blacklock, M.D., Professor of Tropical Diseases of Africa, University of Liverpool; Director of the Sir Alfred Lewis Jones Laboratory, Freetown. Freetown: Government Printer.

General Observations.

This important work ends with a survey of general questions. An opportunity arose of making a re-survey of the village of Kaiyima, where extensive sanitary reforms had been undertaken as the outcome of a previous report in 1923–1924. It is satisfactory to note that the sanitary improvement carried out at Kaiyima, combined with the activities of the medical officer, have caused a diminution in the goitre percentage from 41 to 23 in males, and from 72 to 52 in females. A diminution in the schistosomiasis evidence could also be recorded, giving a positive percentage of 42 as compared with a percentage of 65 in 1923. A well-deserved tribute is paid to the Paramount Chief who, alone of all the Chiefs, has fulfilled his promise of trying to make his town healthy. In the survey of the Central and Southern Provinces, it was observed that far more persons of advanced age were seen at examination, and that large numbers of persons with congenital and other abnormalities appeared to survive. In every village there were found people who understood English and were familiar with several European drugs. Their superior economic status and their better and more varied dietary presumably increases their resistance to disease, for generally speaking the disease incidence was less than in the Northern Province. In conclusion it is strongly advocated that aspirants to the posts of Paramount Chief, Chief, and Sub Chief, should be required to show some knowledge of, or evince some interest in, the measures by which the health of their people could be improved.

PUBLIC HEALTH SERVICES

MENTAL HOSPITAL REPORTS.

The Leicester City Mental Hospital at West Humberstone had 976 patients in residence on March 31st last, and the accommodation for recent and acute cases has now become inadequate. A new nurses' home is being built and the committee are considering the provision of a reception hospital. The recovery-rate for the year was 39·26 per cent. and the death-rate 7·15 per cent. This is a slight decline in the former and increase in the latter, both accounted for by the admission of chronic and unsatisfactory cases from the North Evington Infirmary. The cause of death was verified in 86 per cent. of cases by post-mortem examination. There was a mild outbreak of dysentery among the women in October, but no deaths resulted, and otherwise the general health was good. Parole is allowed to 60 per cent. of the men and 38 per cent. of the women, and during the year leave of absence was granted to men on 3576 occasions and to women on 1474 occasions, while 77 per cent. of the patients were usefully employed. General paralysis is treated by malaria; during the year 15 patients were inoculated, of whom five died and four have been discharged. Since the treatment was first introduced in 1924, 81 patients have been treated, with a discharge-rate of 24·7 per cent. and an improvement-rate of 18·5 per cent. In addition to the work with malaria and with the dysentery outbreak, the pathological laboratory carried out a large number of routine observations and investigated the Vernes test. The visiting dentist performed 351 operations, and inspected 40 patients, whose teeth were in good condition. The arrears of dental disease before a dental clinic was held have now been overtaken and no patient's health or happiness is burdened any longer by a septic mouth. Of the 114 male and female nurses, 24 men and 25 women are certificated or registered; five members of the staff obtained their certificate during 1930. An out-patient clinic is held weekly, and the committee are considering the appointment of an after-care officer.

The Leicestershire and Rutland Mental Hospital at Narborough had 747 patients on its register at the end of last year. The recovery-rate was 34·6 per cent. and the majority of those recovered were first sent out on trial. The death-rate was 8·2 per cent. and the cause of death was verified by examination in 86·4 per cent. of cases. The general health was good during the year and there was no epidemic disease. The institution, like so many others, is overcrowded, and the committee is taking steps to provide accommodation for quiet senile cases in a "poor-law" institution. Unfortunately, mental defectives are still housed in this mental hospital, and the proposed colony will not be available for them for some time. Great improvement has been brought about by the provision of a bread-slicing machine and a butter-pat-making machine; instead of the thick slabs of bread spread with margarine hours before it was eaten, each patient now receives two slices of nicely cut bread and two pats of margarine (10 per cent. butter), kept in the cold room until a few minutes before the meal. Not only do the patients greatly appreciate this, but at least two hours of a nurse's time is saved in each ward, and the new system ensures that every patient gets a correct ration of fat. The uniform of the staff has been changed to a modern type, which greatly pleases the wearers and helps to increase the "nursing" atmosphere. The laboratory started to function at the close of the year, and clinical rooms have been provided. Cases of general paralysis—of which only three were under treatment this year—have been treated by sulpharsenol, but malaria inoculation will be used in future. A dental surgeon has been appointed, and members of the staff of the Leicester Royal Infirmary act as consultants when required. A cinematograph machine was provided during the summer, to the great delight of the patients. The use of parole has been extended.

The Cumberland and Westmorland Mental Hospital had 854 patients resident on Dec. 31st last. The recovery-rate was 43 per cent.—58 per cent. for the males—and the medical superintendent attributes this gratifying figure largely to judicious granting of parole and trial visits. The death-rate has dropped from 8·4 to 6·2 per cent. and the phthisis rate has also fallen. There was one case of paratyphoid fever, but otherwise the health of the community was good. The medical superintendent pleads for the provision of an admission block arranged on modern lines and for the appointment of a social worker. He is also anxious to introduce an occupation centre. A laboratory is being established. The staff are prepared for the R.M.P.A. examinations.

There were 1082 patients in the County and City of Worcester Mental Hospital at Powick at the end of last year. A day room and a dormitory have been redecorated and set apart for recent admissions, and a verandah is to be added to this department. The recovery-rate for the year was 31 per cent. and the death-rate 6·2 per cent. Autopsies were held in 75·8 per cent. of cases. The general health was good, except for one case of typhoid and one case of paratyphoid fever. The dentist visits once a fortnight. Electric light is to be installed shortly and it is hoped that a cinema, X ray and ultra-violet ray plant will soon follow. During the year five male and five female nurses obtained their R.M.P.A. certificates.

The Glamorgan County Mental Hospital at Bridgend was overcrowded at the end of last year by no less than 295 patients, the total in residence being 2108 on Dec. 31st. The recovery-rate for the year was 29·7 per cent. and the death-rate 6·6 per cent. Post-mortem examinations were performed on 52·5 per cent. of cases. The general health was remarkably good considering the overcrowding, and the only epidemic disease, apart from influenza, was chicken-pox (four cases) and erysipelas (one case). The dental surgeon visited fortnightly and attended 258 patients. The visiting surgeon performed three operations, and 60 diagnostic X ray photographs were taken. Over 60 patients were allowed out on trial before discharge, but only seven of them received money allowances. The visiting commissioners deplore the absence of a laboratory, continuous bath, malarial treatment for general paralysis, and adequate verandah accommodation. Parole is allowed to 20 men beyond the estate and to 125 within it. Seven women nurses are employed on the male side and 112 men and 44 women are certificated or registered. Fifteen attendants and eight nurses obtained their R.M.P.A. certificate last year.

MENTAL DEFICIENCY.

The Royal Eastern Counties' Institution for the Mentally Defective at Colchester has now over 1400 patients on its books. Many improvements were carried out during last year, at a cost of nearly £7000. A new single-storey hospital has been built, with 31 beds. This left accommodation on one side of the old hospital for the senior male patients, who needed a quiet place where they could do as they liked; the oldest "boy" is 84 and the next is 77. The furniture for both these new departments was made by inmates, who also built two staff cottages, doing all the work except the internal plastering. Central heating has been installed at Bridge Home, where it was a necessity for the low-grade boys with poor circulations. A wireless installation has been bought and so also has an electric gramophone, which will broadcast to all stations in the institution. A great many other minor improvements have been made, the greater part of the work being done by the boys and girls themselves. During the year 58 patients were sent out on licence, bringing the total on licence to 115. Thirty (20 per cent.) returned during the year; 12 of these, however, only returned for holidays or illness and went out again. Only two definitely came back for bad behaviour. There were only 17 deaths during the year, which is very satisfactory when it is remembered that many of the children are physically disabled and of so low grade that they seldom seem to know when they are ill, and only the most careful observation on the part of the staff detects the first beginnings of ill-health. The guides and brownies have now taken 420 second-class and proficiency badges and the scout troop and cubs have had a successful year, having won over a hundred second-class and proficiency badges. There has been a steady decline in the number of deaths from tuberculosis; this seems to date from 1905, when the ventilation of the institution was remodelled. There has now been no case of diphtheria since 1925 when the Schick test was instituted as a routine. Dr. F. Douglas Turner discusses the causation of mental defects and derives hope from the general tendency at the present time to ascribe at least half the cases to disease, toxæmia, or injury. He welcomes the appointment of a research medical officer and a social investigator who are to make the fullest possible investigation into each patient and carry out such lines of research as occur to them. Discussing the duties of local authorities under the Local Government Act, he stresses the importance of providing one all-embracing colony for every type of defective; the different types will live in different classes according to age, conduct, and mental capacity, but the colony must include all those for whom the local authority is responsible, except the dangerous cases.

Medical Diary

SOCIETIES.

OXFORD OPHTHALMOLOGICAL CONGRESS.

Thursday, July 9th.—10 A.M., in the Department of Human Anatomy, Opening Address by Mr. A. B. Cridland. Symposium on the Diagnosis of Intracranial New Growths, by Mr. Leslie Paton, Sir Percy Sargent, Dr. H. M. Traquair, Mr. Norman Dott, and Prof A. Schüller.

Friday.—11 A.M., Doyne Memorial Lecture by Mr. P. H. Adams.

ROYAL MEDICO-PSYCHOLOGICAL ASSOCIATION: Annual Meeting at the Royal College of Physicians, Dublin.

Wednesday, July 8th.—2 P.M., Presidential address by Mr. R. R. Leeper on the Progress of Psychiatry.

Thursday and Friday.—10 A.M., Papers and discussions.

LECTURES, ADDRESSES, DEMONSTRATIONS, &c.

FELLOWSHIP OF MEDICINE AND POST-GRADUATE MEDICAL ASSOCIATION, 1, Wimpole-street, W.

Monday, July 6th, to Saturday, July 11th.—St. Peter's Hospital, Henrietta-street, W.C. Wed., at 5 P.M. Demonstration of cases in the Out-patient Department and Urethroscopies by Mr. A. H. Harkness. Open to men only, free.—Hospital for Diseases of the Skin, 71, Blackfriars-road, S.E.: Fri., at 6 P.M., Demonstration of Cases by Dr. W. B. Winton. No fee.—Royal Waterloo Hospital, Waterloo-road, S.E. Wed., 4.30 P.M., lecture by Dr. G. M. Slot on Recent Advances in Treatment of Gastro-Intestinal Disease.—St. John's Hospital, Lewisham. A special course in Diseases of Children by Dr. John Gibbens. Every afternoon, and Sat. morning.—Prince of Wales's Hospital, Tottenham, N.15. Intensive course in medicine, surgery, and the specialties, for two weeks, 10.30 A.M. to 5.30 P.M. (first of two weeks).

WEST LONDON HOSPITAL POST-GRADUATE COLLEGE, Hammersmith, W.

Monday, July 6th.—10 A.M., Gynæcological Ward Visit. Genito-Urinary Operations, Skin Department. 11 A.M., Surgical Ward Visit. 2 P.M., Surgical Ward Visit. Medical, Surgical, Eye, Gynæcological Out-patients.

Tuesday.—9.30 A.M., Operations. 10 A.M., Medical Ward Visit, Dental Department. 11 A.M., Throat Operations 11.30 A.M., Surgical Clinical Demonstrations. 2 P.M., Medical, Surgical, Throat, Out-patients, Operations, Medical Ward Visit.

Wednesday.—10 A.M., Medical Ward Visit, Children's Medical Out-patients. 2 P.M., Medical, Surgical, and Eye Out-patients, Gynæcological Operations. 4.45 P.M., Venereal Diseases.

Thursday.—10 A.M., Neurological Department. 11.30 A.M., Treatment of Fractures. 2 P.M., Medical, Surgical, and Eye Out-patients. Genito-Urinary Department Operations.

Friday.—10 A.M., Medical Ward Visit, Skin and Dental Departments. 12 noon, Medical Lecture. 2 P.M., Medical, Surgical, and Throat Out-patients. Operations.

Saturday.—9 A.M., Throat Operations. 10 A.M., Medical Ward Visit, Surgical and Children's Medical Out-patients.

CHARING CROSS HOSPITAL MEDICAL SCHOOL POST-GRADUATE COURSE.

Sunday, July 5th.—10.45 A.M., Mr. L. R. Broster: Surgical Emergencies. 11.45 A.M., Dr. J. E. M. Wigley: Demonstration of Cases of Skin Disease.

ROYAL NORTHERN HOSPITAL, Holloway-road, N.

Tuesday, July 7th.—3.15 P.M. (at the Royal Chest Hospital), Dr. J. Maxwell: Intrathoracic Lipiodol.

ST. MARK'S HOSPITAL, City-road, E.C.

Thursday, July 9th.—4.30 P.M., Mr. Lockhart-Mummery: Perineal Excision of the Rectum, with cinematograph demonstration.

UNIVERSITY OF BIRMINGHAM.

Tuesday, July 7th.—3.30 P.M. (at the General Hospital), Mr. Musgrave Woodman: Infection of the Ear in General Practice.

Friday (at the Queen's Hospital).—3.30 P.M., Mr. J. N. Sankey: The Diagnosis and Treatment of Infections of the Hand.

Appointments

REGAN, D., M.B., Ch.B., N.U.I., has been appointed Asst. Medical Officer and Asst. Schools Medical Officer, Ilford.

RYMER, N. A., M.B., Ch.B., Leeds. Certifying Surgeon under the Factory and Workshops Acts for Hull.

Vacancies

For further information refer to the advertisement columns.

Accrington, Victoria Hospital.—H.S. £150.
All Saints' Hospital for Genito-Urinary Diseases, 91, Finchley-road, N.W.—H.S. At rate of £150.
Association of Surgeons, Wimpole-street, W.—Surgical Scholarship. £350.
Barnsley, Beckett Hospital and Dispensary.—Cas. O. and H.P. £250 and £200 respectively.
Bath, Royal Mineral Water Hospital.—Hon. Electrologist.
Bath and Wessex Children's Orthopædic Hospital, Coombe Park.—H.S. At rate of £120.
Birkenhead General Hospital.—Hon. Surgeon to Ear, Nose, and Throat Dept.
Birmingham, Midland Hospital, Easy-row.—H.S. £150.
Birmingham, Selly Oak Hospital.—Casualty O. At rate of £200.
Bolton Infirmary and Dispensary.—Two H.S.'s. Each £150.
Brighton Borough Infectious Disease Hospital, &c.—Res. M.O. £400.
Bristol Eye Hospital.—Asst. Res. H.S. £100.
Bristol Royal Infirmary—Sen. Res. M.O. £200. Also Res. Dental H.S. and Res. Cas. H.S. Each £80. Also Res. H.P.'s and H.S.'s. All at rate of £60. Also Hon. Asst. to Obstetric Dept.
Bury Infirmary, Lancashire.—Third H.S. At rate of £150.
Cambridge, Addenbrooke's Hospital.—Res. Anæsthetist and Emergency O. At rate of £130.
Cardiff Royal Infirmary.—H.P.'s and H.S.'s to Special Depts. All at rate of £50.
Carnarvon, County of.—Asst. School M.O. £600.
Central London Ophthalmic Hospital, Judd-street.—Out-patient Officer. £200.
Dudley Guest Hospital.—Two H.S.'s. Each £160–£170.
Durham County Hospital.—Two H.S.'s. Each £150.
East London Hospital for Children and Dispensary for Women, Shadwell, E.—Surgeon for Nose, Throat, and Ear Dept.
Enfield Education Committee.—School Dental Surgeon. £500.
Evelina Hospital for Children, Southwark, S.E.—Cas. and Out-patient Officer. At rate of £120.
Exeter, Royal Devon and Exeter Hospital.—H.P. Also H.S. to Spec. Depts. Each at rate of £150.
Fulham Metropolitan Borough, S.W.—Part-time Asst. M.O. for Maternity and Child Welfare Dept. At rate of £300.
Great Yarmouth General Hospital.—H.S. £140.
Guildford, Royal Surrey County Hospital.—H.S. £150.
Hampstead General and North-West London Hospital, Haverstock-hill, N.W.—Cas. Surg. O. for Out-patient Dept. At rate of £100. Also H.P. At rate of £100.
Harrogate Infirmary.—Sen. and Jun. H.S.'s. At rate of £150 and £125 respectively. Also H.P. At rate of £150.
Hospital for Consumption and Diseases of the Chest, Brompton, S.W.—H.P. At rate of £50.
Hove Hospital, Sackville-road.—Res. M.O. £200.
Hove, Lady Chichester Hospital.—Jun. H.P. At rate of £50.
Hull Royal Infirmary.—3rd H.S. At rate of £150.
Ipswich, East Suffolk and Ipswich Hospital.—Cas. O. £120.
Kidderminster and District General Hospital.—H.S. £150.
King's Lynn, West Norfolk and King's Lynn General Hospital.—H.P. At rate of £125.
Kingston-upon-Hull, City and County of.—M.O.H. £1500.
Lancaster Royal Infirmary.—Jun. H.S. £130.
Leicestershire County Council.—Asst. County M.O.H. £700.
Liverpool, Royal Babies' Hospital, &c.—Res. M.O. At rate of £600.
London Hospital, E.—First Asst. and Reg. to Children's Dept. £300. Also Hon. Asst. Anæsthetist.
Manchester and District Radium Institute.—Asst. Radium Officer. £300–£500.
Manchester, City Education Committee.—Asst. School M.O. £600.
Manchester Royal Children's Hospital.—Sen. M.O. £300.
Manchester Royal Infirmary.—Asst. M.O. to Dermatologica Dept. £20.
Manchester, St. Mary's Hospitals.—Five H.S.'s. All at rate of £50.
Maudsley Hospital, Denmark Hill, S.E.—2nd. Asst. M.O. £625.
Middlesex County Council.—Ophthalmic Surgeon. £2 12*s.* 6*d.* per session.
National Hospital, Queen-square, W.C.—Registrar and Res. M.O. Each £200.
Newport, Mon., Royal Gwent Hospital.—Jun. Res. M.O. £135.
North-Eastern (Fever) Hospital, St. Ann's-road, Tottenham, N.—Res. Med. Supt. £1100.
Plymouth, South Devon and East Cornwall Hospital.—H.S. At rate of £100.
Queen Mary's Hospital for the East End, E.—Hon. Asst. Physician.
Queen's Hospital for Children, Hackney-road, E.—H.S. At rate of £100. Also Res. M.O. At rate of £200.
Radium Institute, Riding House-street, W.—H.S. At rate of £150.
Rotherham Hospital.—Cas. H.S. £150.
Royal Free Hospital, Eastman Dental Clinic, Gray's Inn-road, W.C.—Res. H.S. £100.
Royal London Ophthalmic Hospital, City-road, E.C.—Out-patient Officer. £100.
Royal Northern Hospital, Holloway, N.—H.P. At rate of £70.
Sheffield Children's Hospital.—Whole-time Registrar-Pathologist. £350. Also 3rd Res. M.O. At rate of £80.
Sheffield Royal Infirmary.—H.S., Ophth. H.S., Asst. Aural and Ophth. H.S. Each at rate of £80. Also Surg. Reg. £300.
Society of Apothecaries of London, Water-lane, Queen Victoria-street, E.C.—Examinership in Surgery.
Southport General Infirmary.—Jun. H.S. £125.
South Shields, Ingham Infirmary.—H.S. £150.
St. John's Hospital, Lewisham, S.E.—H.S. and Cas. O. Each at rate of £100.
St. Leonards-on-Sea, Buchanan Hospital.—Jun. H.S. At rate of £125.
St. Mark's Hospital for Cancer, Fistula, &c., City-road, E.C.—H.S. At rate of £75.
Sudan Medical Service.—Two M.O.'s. £E.720.
Swansea General and Eye Hospital.—H.P. £150.
Victoria Hospital for Children, Tite-street, Chelsea, S.W.—H.P. and H.S. Each at rate of £100.
Walsall, Manor Hospital.—Asst. M.O. £150.
Warrington Infirmary and Dispensary.—Jun. H.S. £175.
Warwick County Mental Hospital, Hatton.—Second Asst. M.O. £450.
Willesden General Hospital, N.W.—H.P. and H.S. At rate of £100 and £110 respectively.
Winchester, Royal Hampshire County Hospital.—H.P. At rate of £150.
Wolverhampton Royal Hospital.—H.S. and H.P. At rate of £125. H.S. At rate of £100. Also Hon. Fracture and Orthopædic Surgeon.

Births, Marriages, and Deaths

BIRTHS.

CUMMING.—On June 24th, at 56 Brunswick-square, Hove, the wife of Dr. John Cumming, of a daughter.

KERR.—On June 26th, at Bexhill, the wife of John Kerr, M.B., Ch.B., of a son.

LANGFORD.—On June 29th, at Cambridge-villa, Chiswick, W. 4, the wife of John C. C. Langford, M.R.C.S., of a son.

ROACHSMITH.—On June 21st, at Napsbury, the wife of Dr. C. E. Roachsmith, of a son.

ROBERTSON.—On June 25th, at The Green, Godstone, the wife of Douglas Robertson, M.R.C.P., of a son.

MARRIAGES.

HARDY—MANSFIELD.—On June 25th, at St. Michael's Church, Bournemouth, Edward William Dacre Hardy, M.C., M.R.C.S., L.R.C.P., to Dorothy Margaret, eldest daughter of Mr. and Mrs. Merton John Mansfield, of 7, Vernon-terrace, Brighton.

DEATHS.

BAILEY.—On Sunday, June 28th, suddenly, at Holly Bank, Headley, Hampshire, Henry Frederick Bailey, M.R.C.S., aged 86.

BUXTON.—On June 28th, his 76th birthday, at a nursing home, Dudley Wilmot Buxton, M.D., M.R.C.P., of Coldharbour, Boxmoor.

HAHR.—On June 28th, Carl Gustav Waldémar Hahr, M.R.C.S., L.R.C.P., of 50 Seymour-street, W. 1.

N.B.—A fee of 7s. 6d. is charged for the insertion of Notices of Births, Marriages and Deaths.

LIVERPOOL HOSPITALS.—The Royal Southern Hospital, Liverpool, last year admitted 3066 in-patients, and dealt with 25,726 out-patients; the latter figure is a fall of 527, mainly accounted for by the increasing number attending the massage and actinotherapy departments. In the theatre, now inadequate, there were 3603 operations. The average stay of each in-patient was 21 days, and the average weekly cost was £3 1*s.* 9¾*d.* Out-patients cost 6*s.* 3*d.* each. Although the cost of maintenance fell by £3485, the loss on the year's working was £9515. At the beginning of 1930 the debt to the bank amounted to £40,919, but it was reduced by £13,481 by the sale of securities representing the investment of free legacies in the early days of the institution.—The Lady Mayoress of Liverpool last week opened a new wing of the Liverpool Maternity Hospital which has cost £108,000, and was opened free from debt. It is proposed at a future date to add an isolation block and accommodation for medical students. There are now 85 beds and 75 cots, a lecture room, and other facilities for the teaching of nurses undergoing midwifery training, and a pathological laboratory. Last year there were 12,456 attendances at the hospital and 26,371 at the city's clinics.—A new nurses' home has been opened at the Robery Davies Nursing Home, West Derby, which was established six years ago for the reception of middle-class patients. The number of patients increased from 376 in 1928 and 461 in 1929 to 487 in 1930. The building of the nurses' home has made available 12 additional private wards.

NOTES, COMMENTS, AND ABSTRACTS

THE HEROIN HABIT.[1]

THE Council of the League of Nations last May appointed, for the purposes of a conference on the limitation of the manufacture of narcotic drugs and the traffic in opium, Prof. W. E. Dixon (University of Cambridge), Prof. Erich von Knaffl-Lenz (University of Vienna), Prof. M. Tiffeneau (Faculty of Medicine, Paris), and Dr. P. Wolff (Privat docent at the University of Berlin). The Technical Committee of the League thereupon asked the experts to report upon the following questions:—

1. What are the properties of diacetylmorphine (heroin) which make it particularly suitable to serve as a habit-forming narcotic drug, and to form the subject of illicit traffic?
2. What are the therapeutic advantages of diacetylmorphine as compared with those of morphia and other morphine derivatives?
3. Are the therapeutic properties of diacetylmorphine such that it cannot be replaced by other medicaments without ill-effects on the patient?
4. Are not the risks of diacetylmorphine for humanity incomparably greater than the advantages resulting from its therapeutic use?
5. Can the experts state what is the medical practice in each of the countries possessing a highly developed medical system, as regards the use of diacetylmorphine, and give their opinion as to the value of its use?
6. Is diacetylmorphine (heroin) an indispensable drug?

The experts reached a unanimous decision as to the above-mentioned questions, and their report is incorporated in the following document.

Report of the Expert Committee.

PREAMBLE.

As a preamble to the answer seriatim of the questions the experts found that morphine and its derivatives, whether habit-forming or not, possessed certain common characteristics and properties, but exhibited them in degrees so varying that it was necessary to refer to the variations before replying to the questions. The properties of the drug they find to be reduced to the following three principal actions:—

(a) *Analgesic and Euphoric Properties.*—These belong only to the habit-forming morphine alkaloids; they render these alkaloids *pain* relieving, and in certain people they alter psychical reflexes, so as to produce a feeling of *happiness and well-being.* The continual use of such alkaloids leads to addiction, and the addict acquires an irresistible craving and ever-increasing tolerance.

(b) *Depressing Properties on the Respiratory Centre.*—These are common to all the habit-forming morphine alkaloids, though different alkaloids show the effect in different degrees. This effect is manifested principally in the relief of cough and all painful affections of the respiratory system.

(c) *Depressing Properties on the Alimentary Canal.*—These are shown best with morphine, and render it valuable in the treatment of certain forms of colic.

The report continues: The *differences* between the various morphine alkaloids with regard to these properties are chiefly quantitative. These differences are *not necessarily in the same direction;* any one of these properties may be exaggerated, whilst another is at the same time hardly obvious. In *codeine* (methyl morphine), for example, the analgesic and euphoric properties (a) of morphine are very weak, whilst the (b) property is relatively little changed, and the (c) effect is a little weaker. In *heroin* the properties (a) and (b) are stronger, whilst the intestinal action (c) hardly exists.

The knowledge of these properties to the physician is of the utmost importance, not only in the treatment of drug addiction, but, what is much more important, the prevention of this condition. It is also an essential part of the doctors' armamentarium to be able to prescribe these drugs with the least risk, whilst providing for all the patient's requirements. Thus the choice of a drug like codeine for the relief of cough avoids the analgesic and euphoric action of morphine which in this case is useless or even harmful, as it involves unnecessary risks.

REPLIES TO THE QUESTIONAIRE.

1. Heroin is more powerful than morphine and its dose is smaller. Unlike morphine it may be readily taken as snuff. In the East it is occasionally smoked. Also in view of the smallness of its dose, trafficking is easier. Heroin euphoria is much more pronounced than that of morphine, and constipation does not occur in the addict—that is, the (a) and (b) effects are stronger and the (c) effect negligible.

2. Heroin has about double the action of morphine in the relief of pain (a). It is more effective than either morphine or codeine in the relief of cough (b). It does not constipate.

3. The properties of heroin, which render it popular with some physicians, can in most if not all cases be efficiently replaced by other morphine drugs. For the relief of cough codeine is a valuable substitute, though not so strong as heroin; dicodid has as powerful an effect on the respiratory centre as morphine, though less than that of heroin, and its addiction properties are less pronounced than those of the latter drugs. For the relief of pain in patients in whom it is undesirable to act on the bowels, heroin is better than morphine but dilaudide offers the same advantages. This alkaloid has much the same type of effect on the respiratory centre as heroin but is weaker; it has about the same influence as heroin in its pain-relieving properties, and, like heroin, has little effect on the alimentary canal. Furthermore, the euphoric effects of dilaudide are weaker than those of both morphine and heroin as gauged by withdrawal symptoms.[2]

4. We feel that the dangerous nature of heroin from the social point of view overshadows its therapeutic importance. The social dangers of heroin arise on the one hand from the great reputation this substance possesses among drug addicts and from the enormous illicit traffic which has arisen; on the other hand, they come from its characteristic habit-forming properties, which, from the medical point of view, are much worse than those of other habit-forming narcotic drugs. The effect of heroin is in the main to produce a change in personality as shown by an utter disregard for the conventions and the morals of civilisation. The disease progresses more rapidly than with any other habit-forming narcotic drug; all the higher faculties of mind, such as judgment, self-control, and attention, are weakened, and such people rapidly become mental and moral degenerates. The heroin habit is the most difficult of all to cure; sudden withdrawal of the alkaloid which, according to most authorities, is the best treatment for the morphine habit, may lead to cramps and convulsions and even to death from respiratory failure. But besides the difficulty of withdrawal, the after-convalescent treatment, both psychical and physical, is longer and more difficult with heroin, and relapse is the rule.

5. The opinion of the medical profession on the therapeutical value of heroin varies not only in

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[1] League of Nations. Traffic in Opium and Dangerous Drugs; Expert Report of a Technical Committee on Heroin.

[2] With regard to the recently introduced dilaudide, Profs. Dixon and Tiffeneau desire to place on record that they have had no personal experience.

different countries but even in the same country. The medical consumption rates per head of the population for this substance, as shown by the League statistics, differ to such an extent that it suggests that its use is perhaps not unconnected with fashion. For example, there is a difference of 400 per cent. between the consumption rates for Great Britain and Germany, 4000 per cent. between those of Switzerland and France, and 4500 per cent. between Switzerland and Japan. Our attention has been drawn to the use made of heroin in the following sickness insurance societies (Krankenkassen) of two large cities in Central Europe. The Allgemeine Ortskrankenkasse der Stadt Berlin, with a membership of about 500,000, shows for 1927 a consumption of 0, and for 1928 a consumption of 3·24 g. If this figure were accepted as a basis of estimation, then for a group of 65,000,000 of inhabitants which represents the whole German population, the consumption should only total 425 g., whereas the actual consumption of this country was 36 kilos during the same year. The Krankenversicherunganstalt der Bundesangestellten of Vienna, which has also a membership of about 500,000, shows for the same period a total consumption of 144 g. Estimated on this basis, the total consumption of Austria would amount to 1930 g., whereas it was actually over 5 kilos. In considering these figures it should be borne in mind that these two groups of insured people belong to large urban centres whose narcotic consumption is usually higher than that of the rural populations, and that the members of these societies always represent that portion of the population which is best provided for as regards medical assistance. We have evidence that a large majority of the eminent pharmacologists and physicians throughout Europe and America are definitely opposed to the employment of heroin in medical practice.

6. In view of the evidence which we possess, and especially the fact that all the beneficial actions of heroin can in our opinion be obtained by one or other of the drugs mentioned, we believe that heroin can be entirely dispensed with. If the doctors in countries where heroin is used are afforded the opportunity of examining and testing clinically the morphine derivatives to which we have drawn attention, we feel little doubt that they may be induced to dispense with the use of heroin entirely.

A DEMONSTRATION OF THE SCHELLBERG APPARATUS.

A DEMONSTRATION was held at 55a, New Cavendish-street, London, on Thursday, June 25th, of this apparatus for colonic lavage, when a considerable assembly heard a description by Dr. Kerr Russell of the working of the apparatus while there was an informal debate on the medical claims for the treatment. From the mechanical point of view, the construction of the apparatus is ingenious and not difficult of manipulation, as was made clear by Dr. Russell's explanation. The object is to irrigate the cæcum and colon by the passage of a rubber tube by stages, and in the course of a varying number of sittings, along the complete length of the colon into the cæcum. The apparatus consists of three movable reservoirs for holding the different fluids used, a three-way tap for permitting the in-flow, and a tap for discharging the fluid siphoned from the colon into a container and thence to a soil pipe. Different thicknesses of rubber tubing are available. A central and large container holds two gallons of warmed distilled water. This is used for the first stage, to aid the catheter to be passed through the impacted masses right up to the cæcum. Arrived there, it is gradually withdrawn, and the contents of the two other smaller containers (of two quarts each) are gradually introduced during withdrawal. In this way the whole colon, from the cæcum to the anus, can be irrigated, it is claimed, with any substance prescribed. When the tube is completely withdrawn a natural evacuation of the bowel contents should follow, though this may not be obtained until after several sittings. The statement that the tube can be made to reach the cæcum has been supported by X ray photographs, when any medicament or disinfectant considered desirable can be injected, one of the commonest of these being a suspension of the anti-fermentative *Bacillus acidophilus*.

HINTS ON DIETS.

PRACTICAL guidance for the construction of diets suitable for use in the treatment of various diseases can be obtained from a handbook,[1] recently published, by Miss Simmonds, who is dietitian to the London Hospital. The principles underlying the selection of foods for use in special diseases and individual cases are briefly discussed, but most of the book is occupied by sample menus which have been found useful in clinical practice. The absence of controversial material is illustrated by the fact that no mention is made either in the text or in the index of diet in the treatment of nephritis, though sections are devoted to salt-poor and high protein diets. The feeding of the infant and young child forms a separate chapter. The practitioner should find this inexpensive volume of considerable assistance in his everyday work.

THE MECHANISM OF VISION.

THOSE who want to know something about the mechanism of vision and the common diseases of the eye without going deeply into the subject will find a little book by Dr. H. G. Merrill and Dr. L. W. Oaks[2] informative up to a point. The more difficult parts of the subject are not made very clear, partly because the diagrams are too scanty. Moreover, experts would object that the treatment of the whole subject is rather too dogmatic. It would hardly be possible adequately to treat such subjects as the relative functions of the rods and cones, the mechanism of accommodation, the circulation of the fluid within the eyeball, or the theory of colour vision in such an elementary book. The most that could truly be said would be that even among experts there is still considerable difference of opinion on most of these subjects. On the other hand, some useful information is given about squint in children with good advice on the necessity of early treatment, although the impression here given—that nearly all cases can be cured by appropriate glasses—is far too optimistic. The photographs demonstrating the types of ill-fitting spectacles commonly seen deserve unqualified praise, and perhaps this section is the most practically useful one in the book.

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[1] Handbook of Diets. By Rose M. Simmonds, S.R.N., Dietitian to the London Hospital. London: William Heinemann (Medical Books), Ltd. 1931. Pp. 108. 7*s.* 6*d.*

[2] Your Vision and How to Keep It. By H. G. Merrill, M.D., F.A.C.S., and L. W Oaks, M D. Second edition. London: G. P. Putman and Sons. 1931. Pp. 145. 6*s.*

HULL ROYAL INFIRMARY.—The 148th annual report records that last year 4100 in-patients were admitted (19·98 days' stay), who cost £2 13*s.* 1¼*d.* each. There were 15,644 new out-patients who were treated at an estimated cost of 4*s.* 0¼*d.* per head. The opening of the Sutton branch has added 100 beds.

PONY RACE MEETING FOR A HOSPITAL.—Recently a "pony race meeting" at Northolt Park was organised on behalf of St. Mary's Hospital, Paddington, with the Earl of Harewood as one of the stewards. All the entrance and parking money went to the hospital, and a large sum was collected on the course by students from the hospital.

EAST SUFFOLK AND IPSWICH HOSPITAL.—Last year this hospital was busier even than during the war, 5074 patients having been admitted with an average stay of 18·42 days, the lowest figure on record by reason of the full use made of the Bartlet Convalescent Home. There were 18,240 new out-patients. In-patients cost £3 2*s.* per week each, and out-patients 7*s.* 5½*d.*

ADDRESSES AND ORIGINAL ARTICLES

TOXIC JAUNDICE.*

By Sir William Willcox, K.C.I.E., C.B., C.M.G., M.D., F.R.C.P. Lond.,
PHYSICIAN TO ST. MARY'S HOSPITAL.

LECTURE II.—SYMPTOMS.

The symptoms of toxic jaundice may be grouped under two headings according to whether they are those of the causal agent or are due to its effect on the liver. Those of the causal agent are naturally of great variety; for example, in acute phosphorus poisoning there will be the acute symptoms of a burning sensation in the mouth and throat accompanied by those of acute gastro-enteritis. These symptoms may subside more or less within 24 hours and are then succeeded, either immediately or after an interval of a day or two, by jaundice and the grave symptoms due to hepatic necrosis. The jaundice due to quinoline derivatives such as atophan may be preceded by no premonitory symptoms or only by slight nausea or occasional vomiting.

Where the causal agent is biological in origin the symptoms of the primary infection, such as typhoid or malaria, will be manifest. In some cases of this type, such as epidemic catarrhal jaundice, the premonitory symptoms may be so slight as almost to escape notice.

The symptoms due to the effect on the liver of the toxic cause vary in intensity according to the amount of impairment of function of the liver cells. The jaundice may be slight or deep. The stools may be pale and clay-coloured for a varying period, ranging from a few days to weeks, and in mild cases the reduced bile-pigments (stercobilin) in the stools may be simply diminished in amount so as to give a yellow colour, paler than normal, for a few days. The urine may contain much bile-pigment, with some bile-salts and some urobilin. The van den Bergh reaction of the blood-serum is usually biphasic. The bile-pigment in the blood is greatly raised and the icterus index much increased. The lævulose-tolerance curve is abnormal and indicates hepatic function deficiency.

The symptoms caused by the increased bile-pigments are slight, since usually the deep jaundice does not persist long enough to give rise to the severe pruritus and skin irritation associated with prolonged mechanical obstruction of the main bile-ducts. The pulse-rate in toxic jaundice is usually quickened owing to the effect of the primary toxic cause. It does not constantly show the slow rate associated with the jaundice due to mechanical obstruction of non-toxic origin.

While the symptoms caused by the increased bile-pigment in the blood are mild, though the colour changes in the skin mucous membranes, urine, and stools are strikingly manifest, yet at any time during the course of an attack the very grave symptoms of auto-intoxication due to loss of hepatic function may develop. These will be considered under the heading of—

Acute and Subacute Necrosis of the Liver.

The term "acute yellow atrophy" has been applied to this condition and is still commonly used in text-books. The term "necrosis" is preferable because it is necrosis, not atrophy, which is the pathological change. The liver, while commonly much smaller in size than normal, may in acute cases be larger (vide Cases 1 and 6), so that the word atrophy, implying smallness of size, is not always appropriate. Then again, while the colour of the liver is usually yellow, in some of the more prolonged cases it may be reddish (vide Case 3), a condition to which the term subacute red necrosis is more accurately applied.

Necrosis of the liver has been classed as a special disease affecting the liver, but pathological studies during recent years show that it really results from some profound toxic cause, due either to an exogenous chemical poison or to the toxins of some toxic infection of biological origin, or to the poisons of the auto-intoxication of a disordered metabolism. It must be admitted that cases of necrosis of the liver are still met with in which the toxic cause cannot with certainty be determined.

The condition has become more frequent of late years. This may be accounted for by increased exposure to drugs having a selective toxic effect on the liver—e.g., arsenobenzol and quinophan.

MORBID ANATOMY.

It appears to me that the term necrosis of the liver should include all those cases where the liver cells have been so profoundly poisoned as to be functionally dead. Thus in an acute case of delayed chloroform poisoning, if death occurs early—i.e., within two or three days—the liver will be enlarged and yellow, and many of the liver cells will show distension with fat globules; if, however, death occurs later—say, in a week or so—the liver will be much shrunken in size owing to the absorption of the cells which previously showed fatty distension. In both of these cases the liver cells must have undergone death from the toxic effects to which they have been exposed.

Usually in necrosis of the liver life is sufficiently prolonged to admit of the shrinkage of the liver, which has been greatly enlarged in the early stages of the illness, so that commonly a much shrunken soft flabby liver is found on post-mortem examination; the weight may be reduced to one-half or even one-third of the normal, and the colour is yellowish or greenish-yellow, often with reddish areas due to subcapsular hæmorrhage. On section, the very acute cases—e.g., Cases 1 and 6—will show a bright yellow appearance, while the less acute cases, such as Case 3, show a yellow groundwork with red areas: subacute red necrosis, to which the old term red atrophy was applied.

The kidneys are enlarged, soft, and bile-stained, and often show small hæmorrhages on the surface. On microscopical examination marked degeneration of the epithelium is present and the tubular cells show marked fatty changes.

SYMPTOMS.

The symptoms of "necrosis of the liver" are dramatic, and run a characteristic and usually rapidly fatal course. Various terms have been used to describe this condition. "Icterus gravis" has been commonly adopted; its disadvantage as a name is that icterus may be slight or even absent in the very acute cases. Some writers have suggested the word cholæmia; this again is unsatisfactory because excess of bile in the blood, as seen in cases of stricture of the common bile-duct, does not per se produce toxic symptoms. Patients with complete obstruction of the bile-duct may live for months without symptoms beyond those of the skin irritation due to the increased bile content in the blood. I would suggest as more suitable for the toxic condition caused by necrosis of the liver the term hypohepatism. This expresses the fact that there is loss of liver function, which is the undoubted cause of the grave symptoms. The term corresponds to similar terms in use expressive of loss of function of the respective organ, such as hypothyroidism, hypopituitarism, and hypoadrenalism.

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* The Lumleian Lectures delivered before the Royal College of Physicians of London on March 19th, 24th, and 26th, 1931. Lecture I. appeared in THE LANCET of July 4th.

Necrosis of the liver is ushered in by nausea, vomiting, and gastric irritation; the tongue is furred, dry, and tremulous; there is a feeling of mental anxiety and sense of impending disaster; the patient becomes restless, quarrelsome, and difficult to manage. Headache and photophobia are sometimes present. Twitchings of the muscles often occur; the knee-jerks become brisker than normal. An extensor plantar reflex may occur at this stage, and is of very serious portent. Transient squint or involuntary ocular movements may occur, and in some cases marked head retraction. The nervous symptoms accompanying the development of acute hepatic necrosis may in some cases very closely resemble those of meningitis, the differential diagnosis being readily determined by the condition of the cerebro-spinal fluid removed by lumbar puncture.

These premonitory symptoms may last from a few hours to a few days and are then commonly succeeded by delirium, drowsiness, and stupor, passing into coma. Cheyne Stokes's breathing is often marked. The temperature commonly rises, and may reach a high level, of 104° or more, a few hours before the end. Hæmorrhages are very common, such as severe hæmatemesis, epistaxis, bleeding from the gums, rectal bleeding, hæmaturia, purpuric patches on the skin, or vaginal hæmorrhage.

Convulsions may develop during the stage of stupor or coma. The plantar reflexes are often, but not always, extensor in the stage of coma. The pulse becomes rapid and feeble. The urine usually contains albumin and some granular casts, and often red blood corpuscles. Leucine and tyrosine crystals, so often described in the text-books as characteristic of this condition, are by no means common in my experience.

Death occurs at varying intervals after the onset of symptoms, usually within three or four days, but it may be earlier where severe hæmorrhages such as hæmatemesis take place.

TREATMENT.

Treatment resolves itself into the treatment of cases: (1) during the stage of toxic jaundice when the jaundice is latent or developed; (2) during the stage when definite symptoms of hepatic inefficiency due to necrosis of liver have developed.

(1) Removal of the toxic cause should be immediate. The approach of jaundice may often be detected by the quantitative van den Bergh or icterus index test.[13] Alkalis, such as citrate of soda, bicarbonate of soda, and citrate of potash, in full repeated doses, should always be administered.[14 15] Saline aperients, such as magnesium and sodium sulphate, are of value in promoting the emptying of the gall-bladder and the free flow of bile. Glucose should be given freely.[16 17] It appears to act by providing the liver cells with glycogen which protects them against the action of poisons. Glucose should be given before the administration of any drug having a toxic action on the liver, such as an anæsthetic or an arsenobenzol compound. An ounce may be given with coffee or fruit juice two hours previously. If toxic jaundice has developed, the free administration of glucose should be continued, and subcutaneous or intravenous methods may be resorted to. I have used liver extract with benefit in several cases where a mild and persistent jaundice has occurred as the result of some chronic intestinal infection of bacterial origin.

Diet should be arranged so that as little burden is thrown on the liver cells as possible. Protein should be greatly reduced and fatty foods eliminated. Fresh fruit juices, glucose, honey, raisin tea, whey, fruits, vegetables, and carbohydrate foods should form the main portion of the dietary.

(2) Where the grave symptoms of acute necrosis of the liver are beginning, active treatment should be adopted without delay. Glucose in 5 per cent. or 10 per cent. solution in normal saline given subcutaneously or intravenously is of value.

Alkalis, such as citrate of soda ʒi and bicarbonate of soda ʒss, every three hours, should be given by the mouth. By rectum bicarbonate of soda 2 per cent. and glucose 5 per cent., as much as can be retained, should be given six-hourly. One or two pints of bicarbonate of soda 1 per cent., with glucose 5 per cent., may be given intravenously with advantage.

Where hæmorrhages have begun, calcium chloride 1 per cent. may be given intramuscularly or intravenously in one dose of 10 to 20 c.cm., and at the same time parathormone in a dose of 10 units may be given subcutaneously. When coma has developed it may be advisable to perform lumbar puncture and draw off 10 to 20 c.cm. of the cerebro-spinal fluid.

Active treatment in the early stages of hypohepatism has not infrequently led to an arrest of the symptoms and subsequent recovery. When the stage of coma has arrived recovery has not often occurred, though a few instances of success have been seen after the adoption of treatment on the above lines.

Classification of Toxic Jaundice.

Toxic jaundice may be best classified according to its causation:—

1. *Chemical poisons*—viz., the halogen group of organic compounds, which includes tetrachlorethane, carbon tetrachloride, chloroform, ethyl chloride, ethyl bromide, trichlorethylene, and tribromethyl alcohol (Avertin).

Arsenobenzol derivatives, such as salvarsan, kharsivan, neo-salvarsan, novarsenobillon, and gallyl.

Quinoline derivatives, examples of which in common use are: quinophan (phenylquinoline carboxylin acid, also known under the names of atophan, agotan, cinchophen, and phenoquin), atophanyl, atoquinol.

Aromatic organic compounds, such as trinitrotoluene, dinitrobenzene, dinitrophenol, picric acid, phenylhydrazine, toluylene diamine, and acriflavine derivatives.

Inorganic arsenic compounds, including arseniuretted hydrogen.

Antimony compounds, inorganic and organic, both of which are much used in the treatment of tropical diseases, such as kala-azar and trypanosomiasis; phosphorus, alcohol, lead, and synthalin.

The above list is of necessity very incomplete, since the number of chemical poisons having a toxic action on the liver is very large indeed. *In this group must be included* mushroom poisoning and snake bite.

2. *Bacterial poisons*, such as the toxins from enteric and paratyphoid fever, parenteric infections, food poisoning, influenza, pneumonia, streptococcal infections, pyogenic infections, and epidemic catarrhal jaundice.

3. *Protozoal poisons*, such as the toxins from syphilis, relapsing fever, yellow fever, spirochætosis ictero-hæmorrhagica, malaria, amœbic dysentery, typhus fever, and kala-azar.

4. *Auto-intoxications*, such as the toxæmias associated with pregnancy, recurring vomiting (acidosis), uræmia, and acholuric jaundice.

1. Chemical Poisons.

THE HALOGEN GROUP OF ORGANIC COMPOUNDS.

The effect of chloroform on the liver in causing delayed poisoning, which is usually accompanied by jaundice, has been known for many years.

It has been found that weight for weight, compared with chloroform, carbon tetrachloride is four times more toxic, and that tetrachlorethane and trichlorethylene are respectively 2·8 and 1·36 times more toxic.[18] These figures must represent the relative toxic action of these substances on the liver cell.

Carbon tetrachloride is extensively used in the tropics as a remedy for ankylostomiasis. Several cases of death from acute necrosis of the liver from the taking of the drug in this way have been recorded, and cirrhosis of the liver may result from continued repeated doses.[19] Fatty degeneration of the liver in animals has also been demonstrated.[20]

Chloroform.—After the administration of chloroform as an anæsthetic toxic jaundice (delayed chloroform poisoning) will occasionally develop. A series of cases in 1911 at a children's hospital in London attracted much attention.[21] Dr. R. S. Frew[21] in 1912 remarked on the frequency of acetonuria in children admitted to hospital, and pointed out that this usually commences 12 hours after admission and continues for three days. He regarded the presence of acetonuria as a sign that there was danger from delayed chloroform poisoning should this substance be given as an anæsthetic. The free administration of glucose rapidly caused a disappearance of acetonuria.

CASE 12.—As a typical case of delayed chloroform poisoning might be quoted that of a boy, aged 12, admitted to St. Mary's Hospital in February, 1916, and operated upon for appendicitis under chloroform anæsthesia. He recovered satisfactorily from the immediate effects of the operation. Three days after the operation he became drowsy, and vomiting occurred on several occasions; definite but not deep jaundice now developed. The drowsiness deepened into stupor and coma, and death occurred five days after the operation and 48 hours after the symptoms of hypohepatism (icterus gravis) commenced.

On post-mortem examination by Sir Bernard Spilsbury, intense degeneration of the liver cells was found, with marked fatty deposition.

In three recent cases of delayed chloroform poisoning occurring in association with difficult labour, on which the post-mortem examinations were carried out by Dr. Newcomb, death occurred respectively three days (Case 6), four days, and four days after the administration of the anæsthetic. In these cases the toxæmia of pregnancy no doubt accelerated the fatal termination. In each case post-mortem examination revealed the typical acute central necrosis of the liver cells associated with fatty degeneration in the periphery of the lobules. Interesting work on the action of chloroform on the liver (dogs and rats) has been published by R. M. Anderson,[22] who finds that it causes central necrosis and fatty degeneration.

In applying these results to human beings it must be borne in mind that the regenerated liver tissue is abnormal in its anatomical structure—i.e., that masses of regenerated liver cells are not grouped into true lobular structure with central and peripheral veins. This is well shown in Cases 2 and 4. There is, therefore, in human subjects a great risk of the development of portal obstruction when recovery has taken place with regeneration of liver cells following the action of toxic agents on the liver. Clinical experience supports this view, as is seen in several cases to be described.

Two unusual cases of toxic jaundice from chloroform have come to my notice.

CASE 13.—A scientific man, aged 50, first seen in September, 1919, the subject of recurring colds, conceived the idea that chloroform inhalations would kill the microbes in the mucous membrane of the air passages. He practised inhalation of chloroform in slight but repeated doses daily for six months. Jaundice then developed with enlargement of the liver, followed by the typical signs of cirrhosis with ascites. Death occurred after 18 months from this cause. There was no doubt that the chloroform inhalations were an important contributing factor in causing the cirrhosis, and also that they had given rise to an addiction habit.

CASE 14.—A lady, aged 44, seen in November, 1930, had for six months been in the habit of putting chloroform in her bath. She had been told that this would reduce her weight by removal of fat. At the end of this period, during which upwards of 124 oz. of chloroform had been used, the patient developed slight toxic jaundice, due no doubt to the inhalation of chloroform vapour during the baths. A good recovery was made after cessation of use of the drug and suitable treatment. The patient said that her weight was reduced by 1½ stone.

Tetrachlorethane, a colourless liquid smelling like chloroform and having a specific gravity of 1·614 and a boiling point of 147°, has the property of being a solvent of cellulose. It was used before the war for the preparation of a solution of cellulose which was applied to the canvas wings of aeroplanes, to give them stability and make them air- and water-proof. The solution, which also contained acetone, alcohol, and benzene, was known by the aeroplane workers as "dope." Its intensive use immediately before and in the early part of the war led to the great exposure of the workers to its vapour.[23] [24] [25]

CASE 15.—On Nov. 15th, 1914, I saw the first case in this country of tetrachlorethane poisoning. The patient came to St. Mary's Hospital and was seen by me in the out-patient department. He gave a history of employment in an aeroplane factory since August 8th, 1914, during which time he had been exposed to the vapour of the dope which he had used for varnishing the wings. He said that ten other workers were similarly affected and that the dope smelt like chloroform; also that others who did not use the dope had similar symptoms.

On Oct. 24th he suffered from jaundice, epigastric discomfort, nausea, and vomiting in the mornings. At my examination marked jaundice was present; the patient was obviously ill, with a temperature of 99·5°, a pulse-rate of 96, an enlarged liver, pale stools, high-coloured urine, and furred and dry tongue.

The diagnosis of toxic jaundice, due to some substance of the chloroform group of poisons, was made. The patient went into the Middlesex Hospital, where he developed ascites, and died on Nov. 26th, 1914. An inquest was held by the late Mr. Luxmore Drew and a post-mortem examination made by Sir Bernard Spilsbury, who found a condition of subacute necrosis of the liver which he attributed to some toxic poison.

Investigations carried out by me on the aeroplane dope showed that the toxic agent was tetrachlorethane. Animal experiments conducted by Spilsbury and myself showed that when rats were exposed to the inhalation of vapour of the dope, or to tetrachlorethane vapour, for eight hours a day for a week, fatty degeneration of the liver and definite toxic jaundice developed; fatty degeneration of the kidney cells also occurred. It was thus established that the cause of death was tetrachlorethane poisoning due to the inhalation of the vapour of the aeroplane cellulose varnish.

A considerable number of cases occurred in aeroplane factories in 1914 and the early part of 1915. Many of these proved fatal, with typical post-mortem signs of necrosis of the liver.[24] [25]

When I visited the aeroplane factory on Dec. 4th, 1914, many of the workers were suffering from malaise associated with nausea, biliousness, constipation, anorexia, and headache, due to toxic latent jaundice, and some of them showed slight icterus of the sclerotics. These workers had not yet gone on the sick-list, but they were in the preliminary stage of the severe toxic jaundice which occurred after further exposure to the poisonous vapour. Tetrachlorethane produces a deep jaundice of toxic type not associated with anæmia. Its action is on the liver cells and not on the blood; in other words, the jaundice is hepatogenous, not hæmolytic. It was found in 1916 that its use could be abolished, since amyl acetate, which is less poisonous, proved to be a good solvent of cellulose and was used in its place.

Ethyl chloride is probably the least toxic of the halogen group of organic compounds; nevertheless a few fatal cases of delayed poisoning have been recorded by Guthrie from its use as an anæsthetic.[14]

Avertin or tri-brom-ethyl alcohol, a white crystalline powder, has recently been introduced as an anæsthetic. It undoubtedly has a marked toxic action on the liver and, though no cases of toxic jaundice have yet been recorded as far as I know, the possibility of danger must be borne in mind and the same preliminary precautions as to diet and acetonuria taken as with chloroform anæsthesia.

Dr. Parsons, who is at present carrying out experiments on its toxicity, has given me permission to record this recent experiment.

A rabbit weighing 1·1 kg. was given subcutaneously 26 c.cm. of 0·2 per cent. solution of crystalline avertin. This represents a normal anæsthetic dose of 0·475 g. per kg. Anæsthesia occurred 80 minutes after administration. The animal was killed 96 hours after administration. Dr. R. Williamson, of Cambridge, made the post-mortem examination. The liver was at once removed. No macroscopic changes were present. On staining with hæmatoxylin and Sudan III. (frozen sections) quite marked fatty degeneration was found in the central and intermediate zones of the lobules (see Plate, Lecture I., Fig. VII.). (×60.)

It seems probable that the toxicity of the halogen organic compounds increases with the increase of the halogen element in the molecule—e.g., tetrachlorethane is more toxic than chloroform or ethyl chloride. The bromine element probably makes a more toxic compound than the analogous chlorine derivative, and the iodine element a more toxic compound than the bromine compound; for example, iodoform is more toxic than bromoform, and bromoform than chloroform, per weight of absorbed drug.

Arsenobenzol Derivatives.—The original compound of this group was salvarsan (dioxydiamidoarsenobenzol hydrochloride), which was introduced by Ehrlich in 1910. His neosalvarsan (1912) was a modification more convenient for administration. In 1914, as a war emergency, kharsivan and neokharsivan were prepared in this country. These substances were identical in chemical and physical constitution with salvarsan and neosalvarsan respectively and had equally valuable therapeutic properties. All the arsenobenzol derivatives have a toxic action on the liver, and great care is required in their use.

Case 16.—A female, aged 23, suffering from secondary syphilis, was on Nov. 30th, 1911, given 0·4 g. of salvarsan and on Dec. 4th, 1911, the same dose. On Dec. 7th epileptiform convulsions occurred, followed by coma and death. The urine contained albumin. Post-mortem examination by Spilsbury showed marked necrosis of the liver. Toxicological analysis by J. Webster and myself showed arsenic in large amount (0·83 mg. As_2O_3 per 100 g. in the liver).

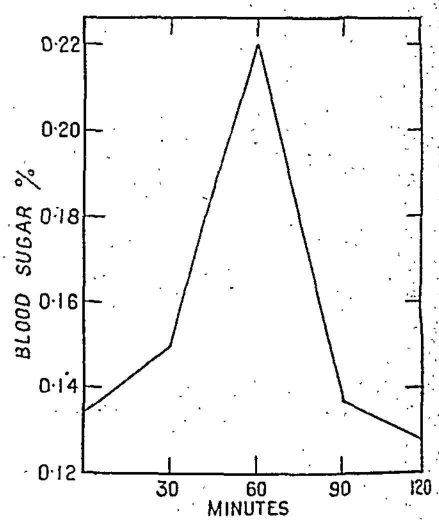
Case 17.—A male adult, with tertiary syphilis and gummata of the legs, was given 0·6 g. of salvarsan on May 9th, 1914. No toxic symptoms occurred. On May 23rd 0·6 g. of salvarsan was given. On May 25th aphasia occurred followed by coma and convulsions and death. Post-mortem examination by Spilsbury showed advanced central necrosis of the liver cells. Toxicological analysis by Webster and myself showed much arsenic in the liver (1·1 mg. of As_2O_3 per 100 g.).

In these and similar cases no arsenic was found in the brain, so that the acute nervous symptoms were not due to the action of arsenic on the brain but to the acute auto-intoxication (hypohepatism) following on the extensive necrosis of the liver. Death occurred before there was time for jaundice to develop.

Fortunately acutely fatal cases of the above type are at the present day of extreme rarity. This is partly due to the careful testing for toxicity of the batches of arsenobenzol compounds before they are placed on the market in this country. This duty has been entrusted to the Medical Research Council since 1915. It may be mentioned that for some unexplained reason arsenobenzol compounds may vary greatly in their toxicity though chemically they may pass the necessary tests.

At the present time in the treatment of syphilis it is realised that for an effective cure large quantities of arsenobenzol are required—very much greater than those contemplated by Ehrlich. The patient can be protected by taking glucose before the doses. Any idiosyncrasy to the drug is an indication for its avoidance and the use of some other method of treatment, such as mercury or bismuth. The doses of arsenobenzol should be spaced out. I have shown that, after an intravenous dose of arsenobenzol, arsenic can be detected in the urine for at least 14 days; therefore if full doses are given this interval should be allowed between the doses.

FIG. 2.



Lævulose-tolerance curve in a case of jaundice due to galyl (dose of lævulose 50 g.). The urine passed at 120 minutes contained no reducing substance.

A typical case of arsenobenzol jaundice which was under my care was:—

Case 18.—A man, aged 44, was admitted to St. Mary's Hospital on July 18th, 1922. He had been attending hospital for tertiary syphilis and glossitis. Galyl injections of 0·25 g. had been given on May 1st, 8th, 22nd and 29th, and on June 6th and 19th. On July 4th jaundice developed. The liver was enlarged, reaching 2 in. below the right subcostal border. On July 20th the lævulose-tolerance test showed a marked reaction for hepatic inefficiency (Fig. 2). The stools were pale for four days after admission, but afterwards became normal in colour. The liver shrank to the normal size, the jaundice disappeared, and a good recovery was made.

Quinoline Derivatives.—These are largely used at the present time for the treatment of gout and chronic rheumatic conditions. The commonest preparation is quinophan (phenyl quinoline carboxylic acid), also known by the trade names atophan, agotan, cinchophen, and phenoquin; it was introduced in 1912. A preparation on the market known as "gorum" cachets contains an appreciable amount of atophan. Atophanyl is a liquid containing equal proportions of sodium atophan and sodium salicylate in solution; it is given intravenously and intramuscularly. Atoquinol is the allyl ester of quinophan. It is a solid and is used for oral administration.

None of these drugs is on the Poisons Schedule and no restriction exists on their sale.

The occurrence of toxic jaundice after the use of quinophan and the above-mentioned group of substances has been noted by many observers for some years.

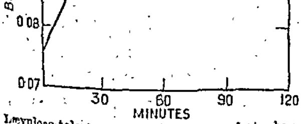
In the *British Medical Journal* in 1926[27] letters appeared from Dr. W. Langdon Brown, Dr. Geoffrey Evans, Dr. C. Worster-Drought and myself calling attention to the numerous cases of toxic jaundice, some of them fatal, which had resulted from the use of this group of drugs. Similar observations have been made in *America*.[28] Mr. H. *Dickson* Wright tells me that he attended a clinical meeting at the Mayo Clinic in August, 1930, when five cases of deep jaundice following the taking of quinophan were exhibited. Such jaundice lasts for several weeks. For some days it is obstructive in type, the stools being clay-coloured and the urine containing excess of bile-pigments. The gall-bladder is *not* enlarged, the obstruction being intrahepatic and due to the hepatitis caused by the drug. The liver is considerably enlarged during the jaundice stage, but the spleen is not. The jaundice persists for many days after the stools regain their normal colour; the van den Bergh reaction is marked and biphasic. In some cases *premonitory warning symptoms occur.* In a fatal case quoted from the Mayo Clinic reports, marked pruritus occurred during the administration of the drug and was controlled by soda baths.

The following is a typical case which was seen by me in consultation with Dr. D. Y. Buchanan at the Ealing Hospital:—

CASE 19.—A man, aged 35, was admitted to hospital on Feb. 4th, 1929. Two tubes of atophan tablets had been taken in November and December, 1928. On Jan. 20th jaundice developed and became deep, and lasted until March 20th, 1929. The stools were pale for the first week and afterwards became normal in colour. The urine contained bile-pigments and bile-salts. The van den Bergh reaction on Feb. 6th was biphasic and 75 units. The patient made a good recovery and is in good health at the present *time.* There was a period of at least four weeks between the cessation of the taking of the atophan and the onset of the jaundice.

CASE 20.—As an example of fatal cases may be quoted that *of a* man, aged 69, who took atophan, grs. 5 t.d.s., *for* six days from July 10th to 16th, 1925. On August 8th he developed rapidly deepening jaundice. The liver was enlarged. The stools were pale for a few days only. On August 31st typical symptoms of acute necrosis of the liver occurred, the patient dying on Sept. 5th. During the last few days the urine contained a trace of albumin and epithelial and granular casts.

FIG. 3.



Lævulose-tolerance curve in a case of atophan jaundice due to taking "Gorum cachets" (dose of lævulose 50 g.).

Two cases of toxic jaundice following the taking of "Gorum" cachets have recently been under my care.

CASE 21.—A woman, aged 70, developed on July 7th, 1930, quickly deepening jaundice about three weeks after a course of Gorum cachets (two daily for six days). The jaundice was of toxic type. The van den Bergh reaction was biphasic and 160 units on July 29th. Ascites developed on August 19th, severe hæmatemesis on Sept. 8th, and death occurred on the 10th. There was no history of alcoholism in this case. The hepatic cirrhosis was no doubt the result *of the hepatitis following* the quinophan in the Gorum cachets.

CASE 22.—A woman, aged 52, took Gorum cachets t.d.s. from Nov. 12th to Dec. 3rd, 1930, and also t.d.s. from Dec. 10th to 24th, 1930. On Feb. 1st, 1931, jaundice developed and rapidly deepened. Vomiting occurred *Feb. 4th.* No abdominal pain. On Feb. 28th, 1931, the liver was enlarged, reaching 2 in. below right subcostal border; surface smooth. Urine contained much bile-pigments and some bile-salts; stools pale Feb. 25th–28th; afterwards colour returned and became *normal on March 6th.* On March 4th, 1931, van den Bergh test was direct positive bilirubin, units 98. The lævulose-tolerance test (Fig. 3) showed a marked positive reaction for hepatic insufficiency. Dr. J. D. Robertson kindly carried out the investigations in *this* case. The patient has been suffering from typical toxic jaundice. On March 13th the liver was reduced in size, the jaundice was clearing, and the patient making good progress towards recovery. On the 23rd she was well apart from some remaining jaundice, the liver being normal in size.

The striking feature about the quinophan cases of toxic jaundice is the marked depth of the jaundice and the absence of any marked anæmia. A marked hepatitis seems to be caused and there is danger of obstructive cirrhosis. It appears that in these cases age is an important predisposition to severity of action of the drug, and for this reason I think that there is danger in its use in persons over the age of 50.

AROMATIC ORGANIC COMPOUNDS.

Trinitrotoluene.—This substance, T.N.T., was used very largely during the war as an explosive, and munition workers were employed on filling shells with it. Numerous fatal cases of toxic jaundice, due to the necrosis of the liver caused by the substance, have been recorded, and several such cases have been under my personal observation.

Two very prolonged cases are worthy of record.

CASE 23.—A woman, aged 32, was admitted into St. Mary's Hospital on July 16th, 1926, under my care. She *had been employed* in a T.N.T. factory in 1915 and had developed toxic jaundice while working there. She had been in poor health since, suffering from abdominal discomfort and nausea. The liver was enlarged, and there was slight jaundice. She was readmitted to hospital on Nov. 9th, 1926. The *lævulose test showed hepatic deficiency.* Ascites developed, and paracentesis was performed on Nov. 20th and Dec. 16th. She was readmitted to hospital on Sept. 8th, 1927, with ascites and jaundice; paracentesis yielded 31 pints. She was readmitted on Oct. 22nd, 1927, with ascites and jaundice; paracentesis yielded 22 pints. She died in December, 1927. There was no history of alcoholism or syphilis. The cause of death was progressive hepatitis set up by T.N.T. poisoning in 1915.

A similar remarkable case (Case 9) was kindly reported to me by Dr. Pulvertaft, of St. Thomas's Hospital. A woman suffered from toxic jaundice while working in a T.N.T. factory in 1918. She developed ascites in December, 1927, and died early in *February*, 1928.

Post-mortem examination showed chronic hepatitis with cirrhosis and more recent yellow atrophy. The sections on microscopical examination showed much fibrosis and many giant cells due to the chronic hepatitis, and also necrosis of the remaining liver cells. In this case the cause of death was no doubt progressive hepatitis set up by the T.N.T. poisoning.

As mentioned in my first lecture cases of jaundice have followed T.N.T. poisoning after an interval of as long as nine months from last exposure.

Dinitrobenzene, dinitrophenol and *picric acid* have all *given rise* to toxic jaundice of similar type to that caused by trinitrotoluene.

Toluylenediamine and phenylhydrazine have been used for the production of toxic jaundice in dogs for research purposes. *Dr. William Hunter showed that* toluylenediamine in dogs had a specific effect on the intrahepatic bile capillaries, causing intrahepatic obstruction and deep jaundice. These experiments have an important bearing on the jaundice following the atophan group of poisons and the arsenobenzol compounds.

Inorganic Arsenic Compounds.—In a paper read before the Medico-Legal Society in July, 1922,[29] I pointed out that toxic jaundice was common in acute arsenical poisoning. Recent examples of this have been furnished by the symptoms of the deceased in the Armstrong case, the Greenwood case, and the Pace case.

Arseniuretted Hydrogen.—This gas is intensely poisonous; it destroys the red blood corpuscles and also produces necrosis of the liver cells. A very interesting and detailed account was published by Dr. J. Dixon Mann and Dr. J. Grey Clegg[30] of five fatal cases in which marked hæmorrhage (hæmaturia, &c.) occurred with jaundice and death from acute necrosis of the liver.

Antimony compounds, inorganic and organic, may cause toxic jaundice in a similar manner to the corresponding arsenic compounds.

Phosphorus is an intense liver poison, causing death rapidly from acute necrosis of the hepatic cells with toxic jaundice. Case 1 is a typical example.

ALCOHOL.

It is universally agreed that the action of alcohol in large doses causes marked fatty degeneration of the liver cells. In some cases the enlargement of the liver is great and the organ of a marked yellow colour, the appearance resembling that seen in fatal cases of acidosis, or delayed chloroform poisoning in children. In this type of case vomiting may be a very marked feature, so much so as to give rise to the suspicion of irritant poisoning.

An interesting case of this type was investigated by me on behalf of the Home Office in 1909.

CASE 24.—A man, aged 50, had been ill in bed for four weeks in the country; the chief symptoms were vomiting of a very persistent character and some diarrhœa. Slight jaundice was present. Death resulted after four weeks' illness, the patient passing into stupor delirium and coma with the usual symptoms of hypohepatism. A few days before death the urine was sent to a local pharmacist for analysis, and very large mirrors of arsenic were obtained after the application of the Marsh-Berzelius test. The wife was suspected of administering arsenic, and the stage was set for another Maybrick case.

The viscera were examined by me. No arsenic was present in any of them. The liver was very enlarged, and had the usual canary-yellow appearance associated with a very marked degree of fatty change. It was typical of the fatty liver found in some cases of alcoholism. The history showed that the deceased had consumed large quantities of whisky for some time and that this consumption had continued throughout his terminal illness. An inquest was held and I was submitted to a severe cross-examination by the coroner. It was clear that the arsenic found in the urine had arisen from the use of impure chemicals containing arsenic. The suspicion of arsenical poisoning was effectively disposed of by my evidence. The cause of death was liver degeneration from alcoholism.

In a few cases acute alcoholic excess has given rise to acute necrosis of the liver with its accompanying group of fatal symptoms. It is clear that in most cases of hepatic cirrhosis alcohol plays a predisposing part, permitting the passage of toxins of bacterial origin through the gastro-intestinal mucous membrane and so on to the liver. It appears that it is these toxins and not the alcohol which cause the progressive hepatic fibrosis.

It must also be borne in mind that cirrhosis of the liver not infrequently occurs in persons who have never taken alcohol. There are many chemical agents other than alcohol which will cause cirrhosis of the liver and also many infective causes, such as chronic intestinal infection, syphilis, and bilharziasis. This being so, it cannot be too strongly emphasised that in cases where death is due to cirrhosis of the liver the cause of death should be regarded as "natural" unless the contrary is proved. The custom of holding an inquest as a matter of routine in cases of cirrhosis of the liver is, in my opinion, contrary to the most modern views of pathological knowledge regarding the cause of this condition, and is a custom which should be discontinued. Needless publicity of a character most painful to the relatives of the deceased is thereby caused to no purpose.

It must, however, be admitted that occasionally a rapidly acute cirrhosis of the liver of virulent type may be set up by alcoholic drinks. Several such cases have been recently reported where death has resulted from what must be regarded as alcoholic poisoning. The drink in question is known as Lisbon wine, and is undoubtedly a very toxic form of alcohol which resembles port wine in colour, though not in taste. It is known in the south and east of London as Red Lizzie. It causes very acute alcoholic intoxication and many deaths have resulted from its consumption. Mr. A. Douglas Cowburn, H.M. coroner for South London, has informed me that he has recently held inquests on several fatal cases of alcoholic poisoning from Lisbon wine.

One such case was under my care at St. Mary's Hospital recently and is worthy of record.

CASE 25.—A male, aged 34, married, was admitted on May 5th, 1930. On admission toxic jaundice and ascites were present. The patient stated that for the last six months he had drunk a bottle of Lisbon wine a day; before that time he had been a beer drinker for four years. This statement was confirmed by his wife. The van den Bergh reaction was biphasic, the icterus index was 54 units, and the blood-urea 21 mg. per 100 c.cm. The Wassermann reaction was negative. On May 24th paracentesis abdominis yielded 15 pints; the fluid was of greenish colour and turbid. On May 28th paracentesis yielded 10 pints, and on May 31st 10½ pints. On June 6th the abdomen was opened by Prof. C. A. Pannett and a condition of acute hepatic cirrhosis was found; the ascitic fluid contained streptococci which had no doubt set up a mild infection from the intestinal organisms. No bowel perforation was present.

This case was obviously one in which official inquiry was required. It was reported to the coroner and post-mortem examination by Sir Bernard Spilsbury showed that a very acute active cirrhosis of the liver was the cause of death.

This case was one of acute cirrhosis of the liver caused by the consumption of a very toxic and bad form of alcoholic drink which was taken right up t the time of the onset of the symptoms. It is a example of the type of case of cirrhosis of the liver which should be reported to the coroner and for which a death certificate should not be given.

In my opinion the decision as to whether a fatal case of cirrhosis of the liver should be regarded as being due to natural causes or the direct result of alcoholic poisoning can only be decided upon by the medical practitioner in charge of the case, and he would be wise, if necessary, to obtain expert medical advice on the point.

VARIOUS OTHER POISONS.

Lead.—Lead poisoning, as ordinarily occurring from industrial or accidental causes, is not definitely associated with toxic jaundice. The intravenous use of lead preparations in the treatment of cancer has shown that toxic jaundice is a danger to be looked for and guarded against.[31]

Synthalin.—An alkylguanidine derivative which was introduced a few years ago as a possible substitute for insulin in the treatment of diabetes has been found in some cases to have a definite toxic action on the liver, and toxic jaundice has been observed after its use.

Mushroom Poisoning.—Poisonous fungi eaten in mistake for edible mushrooms produce acute gastro-intestinal irritation and intense degeneration of the liver cells with marked fatty change in them. The symptoms are those of acute auto-intoxication due to arrest of liver function and are often associated with hæmorrhages. Toxic jaundice is sometimes seen, but death may occur before it has time to become manifest. The post-mortem appearance of the liver resembles that of the enlarged fatty liver seen in phosphorus poisoning or in the delayed chloroform poisoning of children. Common poisonous varieties of mushrooms are *Amanita phalloides*, *A. verna*, and *A. muscaria*.

Snake Bite.—The venom of snakes of the viper order causes a very marked local extravasation of blood which may involve a large area around the bite. Local and sometimes general jaundice may occur after the bites of such snakes.

CASE 26.—On May 30th, 1930, I saw an interesting case of adder bite in a boy, aged 8, who had been bitten on the right middle and ring fingers the previous day. Much faintness and collapse occurred a few minutes afterwards and for 12 hours vomiting and diarrhœa occurred. Blebs containing pink serum appeared at the site of the bites. The whole of the right hand, forearm, arm, and right side of the chest became swollen with blue mottled areas due to superficial hæmorrhages. The swollen area after three days took on a yellowish colour and the swelling gradually subsided. Local but no general jaundice resulted. The boy made a good recovery.

In this case the blood was tested on June 3rd by Dr. Alexander Fleming. The coagulation time was normal and the fragility test of the red corpuscles was normal. The poison appeared to have a powerful hæmolytic action on the red blood cells with which it came in contact and the hæmorrhagic areas in the arms were most marked along the course of the lymphatics along which the poison would be carried up the limb.

Mercurochrome—sodium dibromoxymercuryfluorescein—has been extensively used in the treatment of obscure septicæmic condition. J. H. Burn[32] has shown that samples from different manufacturers vary greatly as regards toxicity. Some samples were three times as toxic as others. This drug while acting more especially on the kidneys and colon must also have a toxic action on the liver and give rise to the risk of toxic jaundice.

Acriflavine.—E. R. Cullinan[33] has called attention to the occurrence of toxic jaundice after the administration of acriflavine. He quotes a case where, after the oral administration of gr. ½ 4-hourly for two months, jaundice developed. Death occurred 14 days later from acute necrosis of the liver. He referred to the experience of Major D. H. Murray who found in 118 cases to which intravenous injections of acriflavine had been given, 11 per cent. developed jaundice. One of these cases died from acute hepatic necrosis. In 1925 Meleney and Zau[34] showed that 0·025 g. per kg. of acriflavine of body-weight killed rabbits in six days. Acute degenerative lesions of the liver and kidneys were found after death. Cullinan's conclusion was that with acriflavine or its derivatives, whether given by the mouth or intravenously, there was a danger of producing toxic jaundice.

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EFFECT OF
BRAIN DIET IN PERNICIOUS ANÆMIA.*

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SINCE Minot and Murphy[1–4] first demonstrated that liver contained material effective in pernicious anæmia, it has been found that other organs are potent in this disease. These investigators also found that kidney was effective, an observation which has been confirmed by McCann[5] and others. In a series of experiments, Castle[6–8] has shown that potent material arises after interaction of beef muscle with normal human gastric juice. On the basis of this work, and after confirming the observation in one case, Ungley[9] gave a diet of raw sheep's stomach to two patients with pernicious anæmia, with a resulting reticulocyte response; and Sturgis and Isaacs,[10 11] Conner,[12 13] and Wilkinson,[14 15] working independently, have clearly demonstrated the potency for pernicious anæmia of hog's stomach. The effectiveness of stomach tissue, however, does not necessarily indicate that the responsible factor is present during life; it is possible that its presence results from a post-mortem interaction between the intrinsic factor and the protein of the stomach wall.[8 10]

It would seem that the specific factor is synthesised in the gastro-intestinal tract, and that the liver, kidney, and possibly other organs act merely as storehouses.[8 9]

Although Minot and Murphy[1] noted neurological improvement in their cases, there has since been considerable difference of opinion amongst other observers as to the efficacy of liver and liver extract therapy with regard to the symptoms resulting from damage to the nervous system. The results obtained in the series of cases reported by Ungley and Suzman,[16] by Baker, Bordley, and Longcope,[17] and by Suzman,[18] as well as by other physicians,[19] show that whole liver in adequate amounts is effective in the majority of cases.

In analysing our results, Suzman and I stated: "It appears that the beneficial effect of liver on the nervous system is a specific phenomenon, and not the result of the maintenance of the red cell count at a high level, nor of improvement in the general condition."[16] So far as we are aware, there is no evidence at present that refined commercial extracts will produce similar neurological benefit, although it is possible that such effects might follow the prolonged administration of large amounts. As suggested formerly,[9] there is perhaps a factor which favourably affects the neurological phenomena separate from the one which influences the regeneration of blood. The existence of two such independent factors could be determined in several ways, one of which would be to treat a series of patients for a prolonged period of time with the crystalline compound isolated from liver by West and Howe,[20] which is at least very potent for blood regeneration. Such a procedure is not possible at present owing to the difficulty and cost of producing the substance. Another method of approaching the matter is presented below.

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The lesions in the nervous system are probably the result of a conditioned deficiency[16] just as is the anæmia.[8,21,22] Histological changes in the cord very similar to those in the subacute combined degeneration of pernicious anæmia may occur in pellagra, lathyrism, ergotism, beri-beri, and possibly sprue. Moreover, there is experimental evidence which tends to uphold this deficiency theory. Following Cowgill's original work,[23] Gildea, Kattwinkel, and Castle[24] have produced in dogs changes considered to resemble combined system disease in man by means of a diet deficient in the antineuritic vitamin B (B_1 or F). On the other hand, Mellanby[25,26] has observed cord degeneration similar to that in pernicious anæmia in dogs fed on a diet rich in cereal, but lacking vitamin A. Mellanby[26] discusses the possibility that the beneficial effects produced by whole liver in subacute combined degeneration may be due to the fat-soluble part of liver. In any event, it seems probable that the regression of neurological symptoms and signs which follows adequate liver therapy is the result, at least in part, of supplying sufficient quantities of a material that can favourably affect the damaged nervous tissue.

Knowing the degree of effect which liver produces upon the anæmia and upon the neurological phenomena, the ratio of these effects to each other may be used as a standard for comparison. Thus, if it were found that the ratio of the effect upon the nervous system to the effect upon the bone-marrow was markedly different following the administration of an organ other than liver, the existence of two separate factors could reasonably be inferred. It seemed logical to suppose that in nervous tissue one might find both factors, with perhaps a relatively large proportion of the substance beneficial to the neurological condition. For this reason experiments were commenced with a diet of brain.

Clinical Experiments.

The first step was to ascertain whether the blood-regenerative factor was present in brain; the second to determine the effectiveness or otherwise of brain in the treatment of the neurological phenomena.

Method.—Whole bullock's or sheep's brains were used in amounts of 240 to 480 g. (½ lb. to 1 lb.) daily. The material was obtained fresh daily as far as possible, minced, and fed raw. It has been found to be most palatable as a purée with orange juice, ginger ale, or broth, or as a jelly. Desiccated brain (Oxo Ltd.) was administered in three cases, two of which are reported here. In the third, its use was discontinued after a few days because of bowel disturbances and diarrhœa.

As a rule the brain was taken without difficulty. No liver, liver extracts, nor any other known potent material was given during the period of administration of brain.

The results obtained in four cases of pernicious anæmia and in three cases of simple achlorhydric anæmia will now be described.

CASE RECORDS.

CASE 1.—A widow, aged 44, entered hospital with typical pernicious anæmia. The duration of symptoms referable to anæmia was 20 months. For six months there had been weakness of the legs and paræsthesiæ of the extremities. Numbness and tingling involved the fingers and the lower limbs as far up as the knees. She had not had liver therapy at any time. Neurological examination showed some impairment of coördination of the lower limbs without evidence of pyramidal tract involvement.

Following the daily administration of 240 g. of ox brain there occurred the hæmopoietic response illustrated in Fig. 1. Subjective improvement was noticeable by the third week. At the end of 58 days numbness and tingling had disappeared except in the ends of the toes.

An attempt was made to raise the red cell count to five million with brain alone. However, after leaving the hospital, the patient had difficulty in obtaining enough of the substance, and supplemented it with liver. From the Chart (Fig. 1) it will be observed that the red cells increased more rapidly with this diet, which consisted of two pounds of liver and one half-pound of brain a week.

CASE 2.—Male, aged 47, had pernicious anæmia and subacute combined degeneration of 15 months' duration. Numbness and tingling involved the distal one-third of the fingers and the soles of the feet. His gait was slightly ataxic and neurological examination showed considerable involvement of both lateral and posterior columns of the spinal cord.

Before commencing brain diet, it was decided to observe the effect, if any, of vitamin B on the neurological condition in view of the work[23,24] already mentioned. Vitamin B was given in the form of detoxicated embryo of wheat, (Bemax) in doses of 270 g. daily. During this period there occurred an increase of reticulocytes, of mature red cells, and of hæmoglobin, to be discussed further on (Fig. 2).

There was some increased sense of well-being, though less than that which occurs with liver therapy. Paræsthesiæ were unaffected and there was no significant neurological change.

Desiccated brain (Oxo Ltd.) was now commenced in doses of 3·2 oz. daily. This amount is that derived from 1 lb. (480 g.) of whole ox brain. A small reticulocyte response followed, but at the end of 17 days the red cell level was practically unaltered (Fig. 2). The preparation was then discontinued owing to intestinal colic and diarrhœa. Numbness and tingling showed some improvement in degree, but no decrease in extent.

There was no special alteration of the neurological condition during the short period of desiccated brain therapy. Subjective improvement in well-being occurred after 10 or 11 days, but disappeared with the onset of bowel disturbances. The subsequent hæmopoietic response to liver is depicted in Fig. 2.

CASE 3.—A single woman, aged 39, entered hospital suffering from pernicious anæmia and advanced subacute combined degeneration. The disease commenced two years previously with soreness of the tongue and symptoms referable to anæmia. Numbness and tingling of the lower limbs up to the hips began soon afterwards. Ataxia, weakness, and stiffness of the legs developed and became progressively worse. Liver was taken infrequently and in inadequate amounts. For the past three months she had been bedridden, and unable to stand or walk.

Generalised bronchitis with œdema at the bases of the lungs was present on admission. She was markedly pale. Both upper and lower limbs showed evidence of gross pyramidal involvement. Coördination and joint sense were considerably impaired in the legs, with absence of vibration sense below the knees.

The increase of reticulocytes during the period of administration of desiccated brain is shown in Fig. 3. The preparation was discontinued after 12 days because of vomiting. No subjective improvement occurred, nor was there any significant increase of red cells during this period. The subsequent administration of extract (Liveroid) derived from 360 g. of whole liver produced a satisfactory hæmopoietic response (Fig. 3).

CASE 4.—A widow, aged 47, had pernicious anæmia with spinal cord symptoms. The onset was sudden, 16 weeks before entry. Neurological examination showed evidence of pyramidal and posterior column involvement affecting both upper and lower limbs. Her gait was grossly ataxic.

The effect of brain diet upon blood regeneration is illustrated in Fig. 4. Slight subjective improvement in the legs was noted after the tenth day. Liver therapy was substituted at the end of 18 days. On the second day the legs became weaker. Acute fibrinous pleurisy developed on the tenth day, and acute phlebitis of the left femoral vein ten days later. Retention of urine followed, and the urine became loaded with pus. These complications were accompanied by considerable fever and leucocytosis, and ended fatally.

Necropsy showed thrombosis of both femoral veins, extending to the inferior vena cava, and occlusion of the right pulmonary artery with clot, possibly embolic in origin. The spinal cord was the seat of subacute combined degeneration. Microscopically there was in addition to degeneration of the myelin some increase of glial cells and of fibrous glia.†

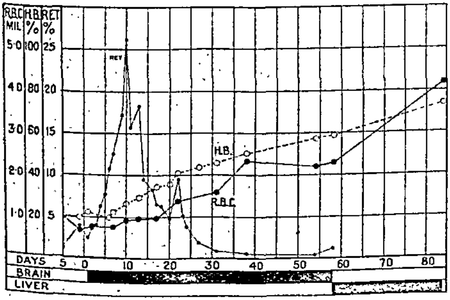
CASE 5.—A married woman, aged 30, suffered from "secondary" anæmia of three years' duration. There was no history of hæmorrhage and no apparent cause for the anæmia apart from a complete achlorhydria. The tongue was pale and clean with atrophy of the papillæ around the edges. The spleen was easily palpable on inspiration. Neurological examination was negative.

Blood examination showed an anæmia of "secondary" type, with marked achromia and moderate anisocytosis and poikilocytosis. The average diameter of the red cells was 6·6 μ (median), with 1·5 μ (dispersion).‡

The effect of brain diet is illustrated in Fig. 5. There was some subjective improvement after the eight days. From the twentieth day onwards the patient failed to take full amounts of the brain owing to gastric symptoms.

CASE 6.—A married woman, aged 39, gave a history of anæmia of three years' duration. Symptoms included sore tongue, slight dysphagia, and numbness of the hands and feet. An atrophic glossitis was present, and there was complete achlorhydria. The spleen was not palpable. Blood examination showed an anæmia of "secondary" type with 2·43 million red cells and 40 per cent. hæmoglobin (Sahli-Leitz); the erythrocytes were somewhat achromic with moderate anisocytosis and poikilocytosis, platelets numerous. The average red cell diameter was 7·5 μ (median) with 1·5 μ (dispersion).

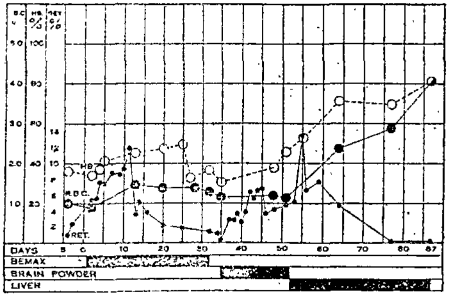
FIG. 1 (Case 1).



Pernicious anæmia. Effect upon reticulocytes, red blood cells, and hæmoglobin of feeding daily 240 g. of raw brain. In this and the following charts, Ret. = percentage of reticulocytes, Hb. = hæmoglobin percentage (Sahli-Leitz), R.B.C. = red blood cells per c.mm., in millions.

The administration of 240 g. of brain daily for a period of 20 days produced no significant alteration of the blood picture. Numbness and tingling of the extremities disappeared, however.

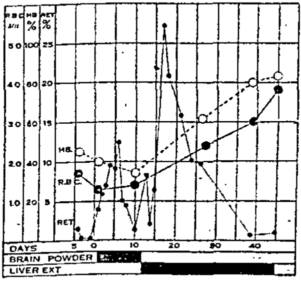
FIG. 2 (Case 2).



Pernicious anæmia, showing: (a) Increase of reticulocytes to 11·8 per cent. during the administration of detoxicated embryo of wheat, 270 g. daily. Initial red cell count 1·02 millions per. c.mm. with 36 per cent. hæmoglobin. Rise of red cells to 1·4 million per c.mm. and to 48 per cent. hæmoglobin in 20 days. Subsequent fall of hæmoglobin following diarrhœa of several days' duration. (b) Second reticulocyte response of 6·8 per cent. on the eleventh day from desiccated brain derived from 480 g. of fresh tissue. No significant increase of red cells in 17 days above the initial count of 1·15 millions per c.mm. (c) Tertiary reticulocyte response of 13·4 per cent. on the fourth day after feeding daily 240 g. of liver with extract (Liveroid) derived from a similar amount. Rapid increase of red cells and hæmoglobin.

CASE 7.—A widow, aged 30, gave a history of anæmia following severe menstrual hæmorrhage a month previously. There was no glossitis and no history of sore tongue or paræsthesiæ. The spleen was just palpable. Gastric analysis after histamine showed complete absence of free hydrochloric acid and pepsin. The erythrocytes which numbered 2·16 million per c.mm. with 30 per cent. hæmoglobin, showed marked anisocytosis, poikilocytosis, and some achromia. The average diameter of the red cells was 7·0 μ (median) with 1·5 μ (dispersion).

FIG. 3 (Case 3).



Pernicious anæmia showing: (a) Rise of reticulocytes to 12·4 per cent. on the sixth day during the administration of desiccated brain derived from 480 g. of fresh substance. (b) Secondary reticulocyte response to 27·2 per cent. on the fifth day, with rapid increase of red cells and hæmoglobin due to extract (Liveroid) derived from 360 g. of whole liver.

Ox brain, 240 g. daily, was given for 20 days without any hæmopoietic response.

Comment.

Although not directly concerned with the subject of this article, it is interesting to note the hæmopoietic response in Case 2 during the administration of detoxicated wheat embryo. The observation needs confirmation before conclusions can be drawn. The reticulocytes were already rising when the vitamin B preparation was first given, so that the possibility of a spontaneous remission cannot be excluded. Minot and Murphy[2] have reported a case of pernicious anæmia in which the administration of extract of wheat embryo produced no demonstrable effect.

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† Although such glial increase is exceptional in an untreated case, Davison[11] states that it is the usual finding in patients who have had liver therapy.

‡ As measured by ocular micrometer, and using a stained smear mounted in balsam. By this method the normal median is 7·8 μ to 7·9 μ with a dispersion of 1·0 μ.[11]

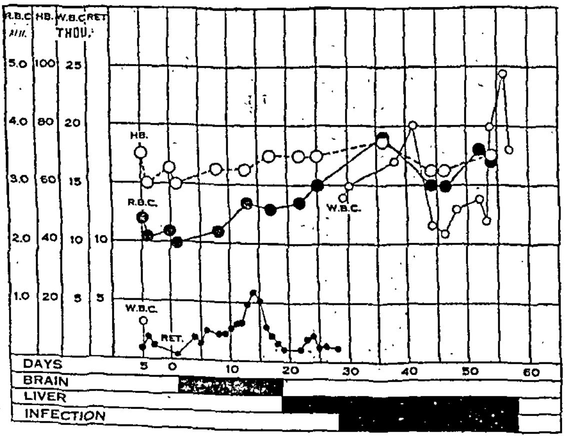
Discussion.

From the results obtained in the four cases of pernicious anæmia described above, it appears that brain contains a substance effective for blood regeneration in this disease. By comparing the reticulocyte response and the rate of red cell increase with those which follow liver in similar amounts,[3 4] one may estimate the hæmopoietic potency of brain relative to that of liver.

Thus in Case 1, the expected reticulocyte rise from 240 g. of whole liver, with an initial red cell count of 770,000 per c.mm. is about 40 per cent. The calculated amount of liver required to give the obtained reticulocyte response of about 20 per cent. is roughly 130 g. The increase of red cells is less than could be expected in 30 days from 240 g. of liver—i.e., 0·9 as against 2·0 millions. The estimated quantity of liver which would give an increase of 0·9 million in 30 days is about 120 g.

The reticulocyte rise which occurred in Case 2 following powder derived from 480 g. of fresh brain was only 6·8 per cent. compared to the rise of 40 per cent. to be expected from 480 g. of whole liver at a similar red cell level. The estimated amount of liver which would give a reticulocyte response of 6·8 per cent. at the same red cell level is roughly 80 g. It is possible that some of the effective substance in brain was lost during the process of desiccation. The rapid rise of red cells with a tertiary peak of reticulocytes, which followed an equivalent amount of liver and liver extract, indicate in the latter a much greater potency for blood regeneration.

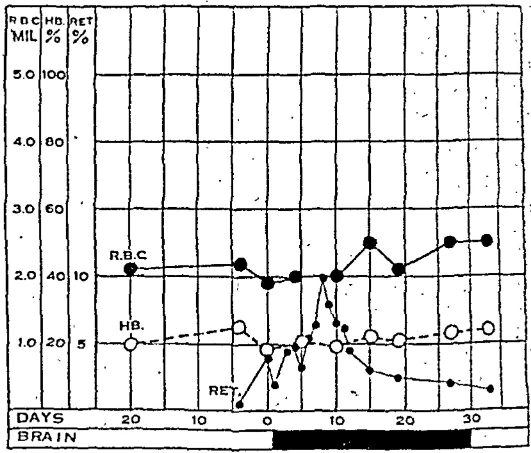
FIG. 4 (Case 4).



Pernicious anæmia showing: (*a*) Reticulocyte response of 5·9 per cent. on the fourteenth day of brain diet. The initial dose of 240 g. was increased to 480 g. on the fourth day. In 18 days the red cell count increased from 2·03 millions to 2·61 millions per c.mm. and the hæmoglobin from 60 per cent. to 70 per cent. (Sahli-Leitz). (*b*) Small secondary rise of reticulocytes to 2·1 per cent. on the sixth day from raw liver 240 g. (increased to 480 g. after six days) and liver extract No. 343 (N.N.R.) derived from 300 g. daily. The case was complicated by infection with accompanying fever and leucocytosis (W.B.C. = white blood cells in thousands.)

In Case 3 desiccated brain was also used. The expected reticulocyte rise from 480 g. of whole liver at a red cell level of 1·27 millions per c.mm. is about 35 per cent.; the amount of liver which would be required to produce the obtained reticulocyte response of about 12 per cent. at the same red cell level is approximately 140 g.

FIG. 5 (Case 5).



Simple achlorhydric anæmia: Reticulocyte response to 9·8 per cent. on the eighth day following 240 g. of raw ox brain daily. Rise of red cells from 1·89 to 2·5 millions per c.mm. but no increase of hæmoglobin.

In evaluating the reticulocyte responses in Case 4, it is necessary to make allowance for the presence of sepsis. Although the response to brain was small and delayed until the fourteenth day, the subsequent secondary rise with liver therapy was also small and less than would be expected. The estimated amount of liver required to produce a reticulocyte response of 5·9 per cent. at a red cell level of 2 million per c.mm. is 120 g., which amount would also be enough to give the rise of 0·6 million red cells per c.mm. obtained in 18 days with brain.

Taking these four cases together, and allowing for certain factors already mentioned, one may estimate the hæmopoietic potency of ox brain in pernicious anæmia as approximately one-third that of ox liver.

The effect of brain on blood regeneration in simple achlorhydric anæmia was mildly positive in one case and negative in two others. It is interesting to note that in Case 5 the red cell count rose without any increase of hæmoglobin. Similar dissociation of response may occur when cases of this type are treated with liver extract; the hæmoglobin percentage may fail to rise until iron is substituted or added.[18]

It now remains to assess the value of brain feeding in subacute combined degeneration of the cord. Whereas for the determination of hæmopoietic potency there is a rapid measurable response it is much more difficult to estimate the effect of a therapeutic agent upon the neurological condition; the rate and degree of improvement are variable even in cases apparently similar and receiving identical treatment. The cases reported above give no positive information as to the effect of brain on the nervous system because the periods of observation were too short. The results so far obtained in a further group of patients with subacute combined degeneration of the cord suggest that its efficacy in this respect is perhaps as great as, and possibly greater than, that of liver. However, it will take many months before it is possible to evaluate satisfactorily the potency of brain in the treatment of the neurological condition.

I wish to express my thanks to the members of the honorary staff of the Royal Victoria Infirmary, Newcastle-upon-Tyne, England, and particularly to Dr. George Hall and Dr. J. C. Spence, for the facilities they afforded me in this work. I am indebted also to Dr. M. M. Suzman, who kindly carried out at the Massachusetts General Hospital the investigations in Case 2, and to Dr. J. H. Means for permission to publish that case.

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EOSINOPHILIA.

A RECORD OF THREE CASES.

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Except as a possible indication of the presence of intestinal parasites, very little attention is paid by the clinician to the percentage of eosinophil cells in the differential count of the leucocytes. An eosinophilia usually leads to a request for a search for parasites or their ova in the patient's stools, while an eosinopenia evokes no comment. This is not surprising, seeing that so little is known of the function of the eosinophil leucocytes. It has to be admitted that in many cases showing eosinophilia there is no explanation of the condition. In spite of frequent search for intestinal parasites or their ova, these have seldom been found in the cases examined at the London Temperance Hospital in recent years. Indeed, I can recall only one case where an eosinophilia of 11 per cent. in a youth led to the search for and discovery of parasites.

Of the ten cases shown in the Table the first five are probably examples of post-infective eosinophilia, which was accompanied by an increase of the lymphocytes and monocytes. The sixth case may have the same explanation, as the insertion of a foreign body—a piece of wood—would give rise to bacterial infection. Case 7 was possibly a reaction to protein poison from the disintegrating growth, while in Case 10 there may have been intestinal worms, which were not discovered in the laboratory. The first five cases indicate the prognostic importance of an eosinophilia, even if for diagnosis it proves of little value.

Table showing cases of Eosinophilia at the London Temperance Hospital, 1927–29.

Case.	Age.	Disease.	Number of leucocytes.	Percentage of eosinophil cells.
1	7	Empyema.	8,800	7
2	42	Gastric ulcer.	7,400	8
3	55	„ „	5,600	9
4	13	Subacute appendicitis	7,000	7
5	25	Rectal fistula.	10,200	17
6	51	Foreign body in rectum	7,600	8
7	35	Recurrent uterine carcinoma.	18,000	17
8	34	Abdominal lymphosarcoma.	7,000	6
9	24	Cirrhosis of liver.	14,400	8
10	20	Abdominal pain, history of worms, no ova found.	13,500	8·5

During the same period in which the cases in the Table were observed, three cases of marked eosinophilia were seen.

Case 1.—A railway-guard, aged 43, was first seen in the out-patient department on April 9th, 1926, and was admitted on April 18th, having a large painless swelling, due to enlarged lymphatic glands, occupying the upper part of the right anterior triangle and extending from just below the jaw to about 1½ in. above the clavicle. The swelling had first been noticed three months previously and had gradually enlarged and pushed the larynx 1 in. to the left of the mid-line. No enlarged glands were detected in the mediastinum or elsewhere, and the Wassermann reaction was negative. The patient suffered from a "rheumatic rash" on his body every spring, a dense papular rash being present on his loins and abdomen on admission.

Section of a gland removed from the neck had the appearance of lymphosarcoma rather than lymphadenoma but the diagnosis was doubtful. Treated with X rays the swelling ultimately disappeared completely.

The following were the results of the blood counts. April 9th: hæmoglobin, 9 per cent.; red cells, 4,520,000; white cells, 30,100; polymorphs, 28 per cent.; eosinophils, 48 per cent.; lymphocytes, 24 per cent.

April 19th: leucocytes, 9650; polymorphs, 48 per cent.; eosinophils, 20 per cent.; basophils, 3 per cent.; lymphocytes, 26 per cent.; large mononuclears, 3 per cent.

On April 30th the leucocytes had risen to 13,600 and the eosinophils to 41 per cent., falling again by May 5th to 12,000 with 14 per cent. of eosinophils.

The eosinophilia appeared to be associated with the skin eruption and disappeared when this subsided, some considerable time before the disappearance of the swelling in the neck. The patient entered the hospital again about a year later for an appendicectomy. No glandular swelling was detected at this time, but he died from a painful affection two years after he was first seen. Whether this affection was of the same nature as the original swelling has not been ascertained.

Case 2.—A single woman, aged 25, a hospital nurse, was admitted on March 21st, 1928. She had first noticed a lump in the left posterior triangle of the neck eight months before. For two months there had been a lump on the right side of the neck, and for two weeks a swelling in the left groin. She had lost weight during the last two or three months. Her mother and an aunt had died of consumption. Her brother and sister were alive and well.

She was a well-nourished woman weighing 7 st. 1½ lb. There was a large mass of smooth adherent glands the size of an orange in the right posterior triangle. No axillary glands were felt, but there was a small smooth gland above Poupart's ligament on the left side. Enlarged glands were felt deeper down in the left iliac fossa. The tonsils were not enlarged. There was an impaired percussion note over the manubrium sterni with weak breath sounds on the left side. There was no enlargement of the liver and the spleen was not felt.

The temperature was normal and remained approximately so until three weeks later, when a gland was removed from the neck for examination, after which the temperature rose to 100°–101° for 48 hours, and then fell to about 99° again. Six weeks after admission there was remittent fever for 17 days rising to 102°–103°, and then for a week the fever was intermittent.

Examination of the gland removed revealed the picture of lymphadenoma—namely, increase of endothelial cells, with many giant cells with centrally placed nuclei and hypertrophy of the reticulum. Many eosinophil leucocytes could be seen. No tubercle bacilli were found in the sputum and no parasites or their ova in the stools. The Wassermann reaction was negative.

On March 22nd a blood count revealed a hæmoglobin percentage of 80; 4,470,000 red cells, and 33,700 white cells; polymorphs, 30 per cent.; eosinophils, 61 per cent.; basophils, 1 per cent.; lymphocytes, 3 per cent.; and large mononuclears, 5 per cent.

On April 4th the hæmoglobin was 80 per cent., the red cells 4,490,000, and the white cells 36,800, with polymorphs, 11·5 per cent.; eosinophils, 77·5 per cent.; basophils, 0·5 per cent.; lymphocytes, 8 per cent.; and large mononuclears, 2·5 per cent.

On May 2nd the hæmoglobin was 62 per cent., the red cells 3,730,000, and the white cells 37,800; with polymorphs, 8 per cent.; eosinophils, 84 per cent.; lymphocytes, 7 per cent.; and large mononuclears, 1 per cent.

On May 11th the white cell count was 56,000; the polymorphs, 12·5 per cent.; eosinophils, 84·5 per cent.; lymphocytes, 2·5 per cent.; and large mononuclears, 0·5 per cent.

On May 17th the white cell count was 106,800, with polymorphs, 27 per cent.; eosinophils, 67·5 per cent.; lymphocytes, 4·5 per cent.; large mononuclears, 1·5 per cent.

On May 25th the white cells numbered 84,600; with polymorphs, 7 per cent.; eosinophils, 88 per cent.; lymphocytes, 4 per cent.; and large mononuclears, 1 per cent.

The patient died two or three months after leaving hospital, which she did at her own request.

There was no obvious explanation of either the excessive leucocytosis or the marked eosinophilia. G. L. Gulland and A. Goodall [1] state that in Hodgkin's disease there is usually a slight leucocytosis due to an increase of the polymorphonuclear cells, rarely beyond 15,000, but record a case with 61,000. Of eosinophilia they say "occasionally there is eosinophilia of from 4–10 per cent., rarely more," while according to V. Schilling [2] eosinophilia is not regularly present, and when it occurs is only slight. Strisower reported [3] a case in which there were 43 per cent. of eosinophils in the blood. Piney maintains that "Eosinophilia of well-marked character is not very common, but may reach quite considerable figures; usually this occurs in company with well-marked leucocytosis."

CASE 3.—A married woman, aged 39, suffering from uterine fibroids, was admitted on Nov. 26th, 1927. She had suffered from anæmia for 20 years. Her present illness had begun six weeks previously. She looked very anæmic, with pale conjunctivæ, lips, and palate, and was very short of breath. No glandular enlargement was found, with the exception of two slightly enlarged cervical glands. The spleen extended 3 in. below the costal margin, and the liver 3¼ in. A test-meal revealed no free hydrochloric acid. The stool contained no occult blood, parasites, or ova. The Wassermann reaction was positive + +.

A blood count taken on Nov. 28th showed a colour-index of 0·5, and a hæmoglobin percentage of 15. The red cells numbered 1,500,000 and the white cells 4200, with polymorphs, 26 per cent.; eosinophils, 35 per cent.; basophils, 1 per cent.; lymphocytes, 35 per cent.; and large mononuclears, 3 per cent. Poikilocytosis was present.

The diagnosis made was severe secondary anæmia. After a course of novarsenobillon injections with treatment directed to the improvement of the anæmia, the following blood count was obtained on Feb. 14th, 1928: hæmoglobin, 65 per cent.; colour-index, 0·56; red cells, 5,770,000; white cells, 4200; polymorphs, 58 per cent.; eosinophils, 11 per cent.; lymphocytes, 31 per cent.; and large mononuclear, 2 per cent.

The anæmia in this case was no doubt due to the syphilitic infection.

That in its tertiary stage syphilis may cause a severe anæmia of the pernicious type is, perhaps, not sufficiently recognised. The eosinophilia is unusual, but A. Piney [4] refers to an eosinophilic congenital syphilitic anæmia, which is accompanied by great increase of eosinophils, and although it is not known whether the case here reported suffered from congenital syphilis—and there may, indeed, be little ground for such a supposition—careful investigation would probably bring to light other cases of anæmia in tertiary syphilis associated with eosinophilia.

The eosinophilia present in each of these three cases was of an exceptionally high degree. Thus the highest percentage of eosinophils in the Table appearing in V. Schilling's "The Blood Picture" is 19 per cent. in a case of eczema with a normal number of leucocytes and in a case of peritoneal carcinoma. In the second case above reported both the leucocytosis and the eosinophilia are almost unbelievably high, probably higher as regards the eosinophilia than has heretofore been recorded. In the photomicrograph of one of this patient's blood films ten of the eleven leucocytes present are certainly eosinophils, the eleventh is doubtful.

In conclusion, I desire to express my thanks to my colleagues at the London Temperance Hospital, Dr. Kevin Byrne and Mr. James McClure for permission to use the notes of these cases under their care.

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[1] The Blood, 3rd ed., Edinburgh, 1925.

[2] The Blood Picture, London, 1929.

[3] Wien. klin. Woch., 1913, No. 1.

[4] Recent Advances in Hæmatology, London, 3rd ed., 1931, p. 248.

PSYCHOSIS IN OSTEITIS DEFORMANS.

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THE absence of mental symptoms in osteitis deformans has been commented upon since the classical description by Sir James Paget [1] in 1876. It is well known that in this disease the skull bones are involved with great frequency, and extensive alterations are produced both in the external configuration of the head and in the capacity and shape of the vault. These cranial deformities have been investigated in detail and classified by Léri,[2] who has also drawn attention to the frequent narrowing of various foramina, both neural and vascular. Briefly, it may be stated that, apart from the greater thickness, there is an increase in the breadth of the interior of the skull while the antero-posterior diameter is lengthened. The depth of the cranial cavity, however, is diminished and the base of the skull becomes flattened or in extreme cases convex.

Despite these well-recognised changes affecting the skull and its foramina, symptoms due to cranial nerve involvement are uncommon. Wyllie [3] has commented on this and has reported two cases of osteitis deformans of the skull with optic atrophy due to compression of the nerve at the optic foramen. Gregg,[4] quoted by Wyllie, has reported compression of cranial nerves causing neuralgias, paralyses, and disturbances of the special senses. Mental symptoms are equally rare. Paget himself wrote: "Even when the skull is highly thickened and all its bones exceedingly altered in structure, the mind remains clear." Cases of altered mentality and of true psychosis have, however, been recorded by Hann,[5] in this country, and more recently in America by Smith[6] and by Kaufman.[7]

In Smith's first case a 50-years' inmate of an asylum was found to have developed Paget's disease but the two conditions were not ætiologically related. The second case, a female aged 60, was confused, delusional, hallucinated, and emotionally unstable, and this condition was thought to have a more direct relationship with Paget's disease and the arterio-sclerosis which accompanies it and which was present here to a marked degree.

Kaufman reported four cases, one of which was doubtful, being associated with a tumour of the cerebrum; the second, a female aged 53, developed psychotic symptoms of paranoid type at the age of 44 and later the changes of osteitis deformans were found in her skull and other bones; the third, a male aged 52, had gross neurological signs and a degenerative psychosis with similar bony disability; the fourth, a female aged 65 with typical Paget's disease of the skull, tibia, and femur, developed the simple deteriorating type of senile dementia.

Hann's case was one of osteitis deformans which showed mental deterioration during the last ten years of life. The bony condition was observed first in the right clavicle of the patient, a woman then aged 41. In ten years the condition advanced to affect obviously and in a classical way the legs, pelvis, arms, spine, and skull. Gross arterial degeneration was observed at this time and the patient began to complain of severe neuralgic pains in the limbs and intractable headache. Slowly, sight and hearing failed and mental symptoms made their appearance and progressed. At 63 cerebral apoplexy occurred; the patient was unconscious three weeks and then slowly recovered. Another such attack occurred at 65 and resulted in death. A partial post-mortem showed that the bony skull was thickened, soft, and reddish in colour. An unusual feature was the presence of numerous bony bosses projecting from the inner table of the vault and ranging from a walnut to a pea in size. Over them the dura was very adherent, and the grooves for the vessels deep. The brain and its vessels appeared normal to the naked eye. The vertex of this skull is preserved in the Museum of the Leeds Medical School and is figured in a text-book by Lawford Knaggs.[8]

In considering the clinical picture, which appears to be an early senile dementia, it is difficult to estimate how much mental deterioration can be related to the slow brain trauma of compression by the bony elevations on the one hand, and to cerebro-vascular degeneration on the other.

REPORT OF A CASE.

The patient was a male aged 63, a fitter by occupation. No familial neuropathic taint was discovered. He was admitted into the dermatological department of the Leeds General Infirmary under the care of Dr. J. T. Ingram. His complaint was of intense generalised itching; a feeling of pricking, especially over the scalp and face, and of "grit coming out of the eyebrows," and slight frontal headache of seven months' duration. His wife admitted that the patient had never been "quite right" and had not worked since the death of his only son four years before. He had developed very severe asthma at this time. Recently he had become a great trial to his friends and family doctor and on more than one occasion had threatened suicide. He had lost nearly 2 st. in weight.

The patient's appearance was somewhat striking; his head, especially the vertex, appeared large, and a superficial examination showed this to be due to bony elevations, particularly of his frontal and parietal bones. There was gross lichenification of the neck and scalp due to persistent rubbing, as a result of which the eyebrows had been entirely removed. Similar excoriations were present over the trunk, especially the shoulders, and a few on the thighs, and there were a few follicular scabbed papules of the scalp.

He described his symptoms intelligently. His attention was good, his memory fair, and his emotional state was on the depressed side. On being rather closely questioned, he elaborated a theory that the chronic irritation of his scalp was due to the presence of a fluid passing to and fro beneath it. He stated that these abnormal sensations, together with slight headache, had antedated the eruption by several months and had caused him to rub and scratch his scalp. He next developed the delusion that the lotions prescribed had got beneath the skin and left a sediment which felt like sand in a state of perpetual motion. He made little complaint of this, however, but was continually making furtive movements over the forehead and scalp which only served to perpetuate the chronic lichenification.

General examination showed a well-marked arcus senilis. The pupils were normal and the vision good. *Ophthalmologic* examination revealed retinal arterio-sclerosis. Hearing was normal, and the nervous system was otherwise normal. All the palpable vessels appeared to be thickened and degenerate. The pulse was regular. The systolic blood pressure was 155 and the diastolic 95. The heart, chest, and urine were normal. Radiological examination revealed Paget's disease affecting the skull-bones, pelvis, sacrum, and both femora. The blood and cerebro-spinal fluid Wassermann reactions were negative. The cerebro-spinal fluid was in other respects normal and the blood count was normal.

The patient continued with his delusion and developed several variants of it, but all with reference to abnormal sensations in the head and scalp.

INCIDENCE OF MENTAL CHANGES.

In order to investigate the frequency of mental changes a further 18 cases of Paget's disease of the skull, who had been in-patients at the Leeds General Infirmary during the past ten years, were investigated. None showed the slightest evidence of mental abnormality, nor were neurological signs suggesting compression of cranial nerves present, with one exception. This was a man who showed advanced disease of the skull-bones and had bilateral nerve deafness. Vision was good in all cases, and such minor changes as could be observed on ophthalmoscopic examination were not more than could be attributed to retinal arterio-sclerosis.

It is of interest to record that three cases in this series had developed sarcoma, one at the upper end of the left femur and a second over the right frontal eminence; the third, under the care of Dr. G. Watson, died of generalised sarcomatosis, the primary sarcomatous change occurring in the ileum with secondaries in the lungs and liver. Spontaneous fractures had occurred in four cases. In the case with sarcoma of the left femur a spontaneous fracture had occurred in the right femur three years before. A second case sustained a fracture of the upper third of the right tibia, the right humerus was affected in the third, while the fourth had a history of multiple fractures of long bones.

I am indebted to Dr. Ingram for permission to report this case and to the honorary physicians of the Leeds General Infirmary for allowing me to review their cases of osteitis deformans.

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PITUITARY CYST.

AN ACCOUNT OF A CASE WITH TONIC FITS RESEMBLING TETANY.

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A CHILD of 5 years of age was taken suddenly ill one morning with frontal headache and vomiting. For two days he vomited all food given to him. He seemed drowsy, but complained of no abdominal pain, and there was no diarrhœa. Physical examination revealed nothing. The child was given alkalis and glucose. There was no acetonuria. There was a low fever. On the third day two convulsions were observed by the parents. The child was described as "drawing himself up and then going stiff all over." During the third and fourth days the vomiting continued whenever feeding by mouth was attempted, but not at other times. There was rapid wasting.

Physical Signs.—I examined the child on the fourth day of the illness. He lay on his side in an uneasy attitude. He had a hectic flush upon the cheeks. His eyes were sunken and his body wasted. Lethargy was marked, but he could be roused to obey simple directions, though he would not answer any questions. Nothing would persuade him to keep his eyes still for an instant, and ophthalmoscopic examination was thus impossible. There was fever of 100° F., but the pulse-rate was not raised throughout my visit. There was no sign of cranial nerve dysfunction, and no disease was found in the ear or throat. The tongue was thickly coated with a moist white fur. The muscles of the body generally were held a little stiffly; the neck resisted full flexion on the chest. Motor functions, as far as they could be tested, were found to be natural and equal on the two sides of the body. The reflexes were normal, with the exception that both knee-jerks were unduly brisk, considering the wasting of the muscles concerned. The left was exaggerated above the right. The plantar responses were flexor. No abnormality was found in the heart, lungs, or abdomen. The walls of the latter were "scaphoid" and resistant.

Course of Illness.—The patient was seen in the evening. A lumbar puncture was suggested, but this was not done, for the medical attendant found the boy very much improved on the following morning, the fifth day of the disease. Five days subsequently—on the ninth day—I was informed that the patient was sitting up and taking food well, and that he seemed nearly normal. Four days later I was again asked to see him. On the previous evening he had become unusually drowsy. Several indefinite fits had been noted by the parents, but none had occurred under medical observation. The doctor in charge had, however, found the child in an attitude characteristic of tetany, and this persisted until I made my second examination.

I found the patient lying limply on his back, unconscious. The head was not extended, but some rigidity was found on attempting movement. Both wrists were in rigid flexion; the hands were partly extended and the fingers strongly adducted, giving the hand the "obstetric" position. The feet were in the position of a performing toe-dancer, in rigid plantar-flexion. Rigidity of arms and legs was much less marked, but was obvious on attempting passive movements. The plantar reflex had now become extensor. No localising feature presented itself, but the father had noticed a squint lasting a short time and spasmodic movements of the left eyelid earlier in the day. The only other notable clinical feature was a continuous rolling nystagmus, without directional components, partaken of by both eyes. The temperature was 101° F. and the pulse-rate 100. The body was further wasted.

A differential diagnosis of tuberculous meningitis or deep-seated cerebral abscess was made, and a lumbar puncture agreed to. Immediately before this was undertaken three convulsions occurred, each lasting some 10 or 15 seconds. In each the trunk was slowly arched with the concavity backwards and to the right, the right leg stiffened into complete extensor rigidity, and simultaneously the left palpebral and facial muscles underwent rapid twitching contractions. Fluid withdrawn by lumbar puncture was clear and under considerable pressure. Analysis showed doubling (50 mg.) of the protein content. Five cells per c.mm. were seen—all mononuclear. The chlorides remained normal. The glucose was raised to 100 mg.

The patient died a few hours later.

Necropsy.—The ventricles of the brain were dilated to a moderate hydrocephalus. A cyst the size of a large grape lay on the under surface of the brain and filled the space behind the optic chiasma. It grew backwards and to the left, flattening the under surface of the mid-brain. The cyst was unilocular and when ruptured it left a smooth concave surface of brain tissue, uncovered apparently by membranes and flattened over an area of 1 in by 1 in. It appeared to grow either from the optic chiasma itself or from the pituitary body. The latter was harder than normal to the touch.

Microscopical examination was undertaken by Prof. G. Haswell Wilson, who gave the following report: "This is an epidermoid carcinoma of the type which might develop from the remains of the hypophyseal duct. It contains a number of cystic spaces, and in places the stroma contains islands of cartilage and spicules of bone. It is sometimes referred to as an "adamantinoma" of the pituitary. It appears to have destroyed the anterior part and to be invading the pars nervosa."

COMMENT.

The question of the differential diagnosis of the precise nature of the tumour is of interest. Its histology does not conform to that of the cysts of Rathke's cleft described by Worster-Drought, Carnegie Dickson, and Crowhurst Archer.[1] There is no ciliated epithelium and no cholesterol, nor is the cyst simple in type. The presence of cartilage and bone might suggest a teratoma. No highly organised tissues were present, however, and manifestations of metaplasia in adamantinoma have been recorded by Ewing.[2]

The entire destruction of the anterior portion of the pituitary body is of interest. In a child of 5 the manifestations of pituitary deficiency of a minor character are difficult to recognise. In the case of a cyst of Rathke's cleft, referred to above, however, reference is made to the child being backward in development before the age of 5. In a case of adamantinoma, recorded by Critchley and Ironside,[3] the child, at the age of 10, had the appearance of a delicate child of 6 or 7. One would expect a complete destruction of the anterior lobe of the pituitary body, such as is described in this case, to produce some signs of delay or alteration in fat metabolism and skeletal development. Doubt has been thrown upon the constant relationship of loss of the anterior lobe of the pituitary body and signs of infantilism. Difficulties arose in ascribing such divergent syndromes as that of Fröhlich and that of Lorain, to lesions of one and the same organ. Camus and Roussy[4] showed that symptoms of "dyspituitarism" could be produced by injury to the tuber cinereum, the pituitary body being left intact. On the other hand, Bellerby[5] quotes Paulesco,[6] Cushing,[7] Blair Bell,[8] and Smith[9] to the effect that removal of the anterior lobe produces a syndrome identical with that of dystrophia adiposogenitalis, and that the disability can be removed in some cases by grafts of portions of the gland. Blair Bell states that clamping or separation of the infundibular stalk was found more effective than removal of the gland in causing the lesions in question.

Critchley and Ironside analysed six cases of adamantinoma. Of these, four had persistent headaches and vomiting bouts over a long period. Ophthalmic signs or symptoms occurred in the majority. One had bitemporal hemianopia; one diplopia and failing vision, with paracentral scotoma and swelling of one optic disc. One had blurred vision with bilateral papillœdema. One had mistiness of vision, and in one consecutive optic atrophy was found. These authors refer to no change in the blood or cerebro-spinal fluid. Worster-Drought, in his case of Rathke's cyst, found a blood-sugar of 0·086 per cent. with a raised sugar-tolerance curve. My case had a cerebro-spinal fluid sugar content of 0·1 per cent.—a slight but definite rise above normality. A striking feature of Critchley and Ironside's series was marked alopecia in two cases.

An interesting and unexplained feature in my case was the occurrence of tonic muscular contractions simulating tetany. There was no reason to suspect true tetany, but calcium chloride with a small dose of Collip's parathyroid extract (5 units) was given. No change in the carpo-pedal spasm or in the general spasticity occurred during the remaining few hours of the child's life. Critchley and Ironside record a comparable occurrence of rigidity in one of their series. It was in a woman of 24 years of age, in whom a decompression operation had been performed for the relief of symptoms. In this case attacks of head retraction occurred, and these were followed by "extension and rigidity of the limbs, flushed face, and immobility of the respiratory muscles." The attack lasted from 15 to 20 seconds. The authors regard the phenomenon as one of decerebrate rigidity. True decerebrate rigidity is produced experimentally by section of the motor tracts, below the level of the red nucleus. The pyramidal and rubro-spinal tracts must be divided.

Cases of "tetany" occurring in cerebral tumours, cerebellar cysts, and syringomyelia are recorded.[10] Dr. James Collier allows me to mention an unpublished case of his at the National Hospital, Queen-square, in which fully developed tetany was associated with papillœdema and slight deafness. In this case a large eighth-nerve tumour was removed from the lateral recess, with resolution of the symptoms. Unilateral tetany has been recorded in syringobulbia,[11] and in cerebral hæmorrhage.[12] In both cases peripheral mechanical and electrical hyper-excitability were present. In Collier's case, as in mine, the diagnosis rests upon the clinical picture only, largely, that is to say, upon the posture. Collier has considered that some cases described as tonic basal epilepsy are in reality cases of tetany associated with a lesion of the central nervous system.[13] Whether electrical and mechanical hyper-excitability are to be regarded as essential features of tetany depends partly upon definitions and even more upon our further enlightenment as to its pathogeny. The method by which the pattern of tetany is imprinted is as yet obscure. But cases such as the one recorded serve as a reminder that the problem is a neurological as well as a biochemical one.

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CLINICAL AND LABORATORY NOTES

A GLYCOSURIC FAMILY WITHOUT HYPERGLYCÆMIA.

SO-CALLED RENAL DIABETES.

BY F. PARKES WEBER, M.D. CAMB., F.R.C.P. LOND.,

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THE MOTHER.

Mrs. E. B., an English woman, now aged 57 years, is known to have passed sugar in her urine (between 1 and 4 per cent.) for at least 44 years—without hyperglycæmia, polyuria, excessive thirst, or other distinguishing signs of diabetes mellitus. Owing to the absence of polyuria such cases cannot correctly be termed "*diabetes,*" *at least, not according to the* original meaning of the term. They can hardly even be termed "renal," excepting in the sense that the glycosuria is due to a low renal "threshold" for sugar, which is a congenital-developmental condition, as the history of the present family (and some other families) shows. Probably glycosuria till now has never been known to have existed quite so long as 44 years, but the patient is every day breaking her own record, and, from the nature of the condition, as now admitted, it is clear that in others it may last for an equally long or longer time. There is no evidence that it has exercised any injurious influence on the general health of Mrs. E. B., or that per se it ever does so in similar cases.

I first saw Mrs. E. B., on June 18th, 1914, when she was 40 years old, on her admission to the German Hospital under my care suffering from acute polyneuritis of uncertain causation; all four limbs were affected, *the upper ones much less severely* than the lower ones. In the hospital the paralysis began rapidly to disappear and by July 17th she could walk about a little. By July 30th her tendon reflexes had all returned.[1] The substance excreted was ordinary glucose, but there was neither polyuria nor excessive thirst, and the blood-sugar was found to be only 0·083–0·094 per cent. No disease in the thoracic or abdominal viscera was discovered by ordinary examination and the blood-serum gave a negative Wassermann reaction.

The most interesting point in the previous history of the patient was that in 1887, when about 13 years of age, she had been an in-patient at the Middlesex Hospital suffering from tonsillitis. From the medical registrar of that hospital I ascertained that according to the notes at that time (1887) she was passing 62 to 124 g. of glucose in 852 to 1705 c.cm. of urine daily, *the specific gravity of the urine being about* 1040.

In July, 1919, Mrs. E. B. saw Dr. W. Langdon Brown on account of headaches; he informed me that she still passed sugar in her urine and that her blood-sugar was within normal limits. When recently I saw her at the German Hospital on May 19th, 1931, her urine was of specific gravity 1036 and contained 3·5 per cent., sugar; it gave negative reactions for acetone and diacetic acid. The blood-sugar (fasting) was 0·096 per cent. There can therefore be scarcely a doubt that (as above stated) Mrs. E. B. has had continuous glycosuria since her urine was tested for the first time in 1887. She has lived a hard-working life and apart from fibrositic troubles and occasional headaches (possibly of the nature of migraine and sometimes accompanied by retching and, if she takes any food, by vomiting), her general health has been good.

In regard to Mrs. E. B.'s parents they are said to have been first cousins and to have died of pulmonary tuberculosis, aged 37 and 58 years respectively. I do not know whether either of them or both of them had glycosuria, but Mrs. E. B.'s two sisters and one brother have not glycosuria. However, Mrs. E. B.'s glycosuria ("renal diabetes") has been inherited by some of her children. She has had five children, all of whom are still living, and one miscarriage, in the following order.

THE FIVE CHILDREN.

1. A daughter, Mrs. P., aged 26 years, who is married and has one child, a boy aged 4 years. Specimens of urine from both of them, examined in May, 1931, have been found free from sugar. They have, therefore, probably escaped the familial glycosuria. It should be noted that this Mrs. P., the eldest child of Mrs. E. B., had a different father than Mrs. E. B.'s subsequent children have had, all of whom now have glycosuria without hyperglycæmia.

2. J. W. B., Mrs. E. B.'s eldest son, aged 21 years, a well-developed young man, when in New Zealand

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[1] Weber, F. Parkes: Acute Polyneuritis in a patient with Chronic Diabetes Mellitus without Hyperglycæmia, St. Bartholomew's Hospital Reports, London, 1914, l., 163.

during November, 1930, complained of headache accompanied by a little vomiting, somewhat similar to his mother's attacks. His urine was examined and found to contain sugar. He was put on an anti-diabetic diet and treated with insulin till his return to England in May, 1931 ; in fact, he received insulin injections even during the voyage home. When I saw him on May 19th, soon after his return, he looked strong and sunburnt ; his urine contained 4·8 per cent. sugar and was free from acetone and diacetic acid. His blood-sugar (fasting) was 0·091 per cent. On May 22nd a blood-sugar curve was taken and found normal, the fasting blood-sugar on that occasion being 0·073 per cent.

3. A daughter, A. E. B., aged 20 years, whose urine, when tested recently, contained 4·3 per cent. sugar. Her blood-sugar curve (June 5th, 1931) was found to be normal, the fasting blood-sugar on that occasion being 0·089 per cent. She is well grown and the only obvious abnormality about her excepting the glycosuria is that she has a typical " nævus anæmicus " on her right hand, which I demonstrated on June 18th at the Dermatological Section of the Royal Society of Medicine. She sometimes has headaches similar to those of her mother.

4. A son, H. J. B., aged 18 years, had 0·3 per cent. sugar in his urine when it was tested recently. His blood-sugar curve on May 29th, 1931; was normal, but on that occasion his urine was free from sugar. It seems that he only occasionally has glycosuria. Dr. George Graham has referred to individuals with true " renal glycosuria," who pass sugar only after a meal. (A miscarriage at the fourth month came (in 1915) between this child and the youngest one.)

5. The youngest child, a boy, A. G. V. B., aged 15 years, was recently found to be passing urine containing 2·5 per cent. sugar. His blood-sugar curve, taken on June 5th, 1931, was normal, the fasting blood-sugar on that occasion being 0·084 per cent.

REMARKS.

This family group, though consisting of only two generations, is interesting, because it shows how in cases of the kind the glycosuria may increase the difficulties of diagnosis, when any infection or temporary illness occurs. Thus, in the mother, Mrs. E. B., in 1914, the unimportance of the glycosuria was not at first recognised when she was attacked by the alarming acute polyneuritis and was almost completely paralysed.

When her son (J. W. B.) had an attack of headache with slight vomiting, as his mother sometimes has, the discovery of sugar in his urine led (in a New Zealand hospital) to the diagnosis of grave diabetes mellitus ; he was apparently given to understand that he would fall a victim to diabetic coma if he did not keep to the special diet and continue the insulin injections. When I heard of his supposed dangerous illness, I naturally suspected that his glycosuria would turn out to be of the same nature as his mother's.

The case of the mother (Mrs. E. B.) is by itself of great interest, since it is clear that she must have been passing sugar in her urine for 44 years without being any the worse for it. Nevertheless, from the elaborate " Study of Orthoglycæmic Glycosuria with Particular Reference to its Hereditability," by Dr. Urban Hjärne (translated by Carl Westman, and published in Stockholm in 1927), a copy of which has been lent me by Dr. Graham, it appears that true diabetes mellitus may occur in " renal glycosuria " families. In the present family the fact that the parents of Mrs. E. B., were first cousins should be noted, though it is not known whether either of them had glycosuria.

I am indebted to the assistance of my house physician, Dr. M. Scholtz, and without the help of Dr. George Graham, I should not have been able to settle the nature of the glycosuria in Mrs. E. B. in 1914.

This account may prove of interest in regard to similar small family groups that are certain to turn up from time to time in England and abroad. Personally it may save me much trouble, as my printed accounts of rare or doubtful cases have sometimes done, by way of replying to doctors under whose observation the individuals themselves or members of their families subsequently fall.

RECOVERY FROM STREPTOCOCCAL SEPTICÆMIA

COMPLICATED BY BRONCHO-PNEUMONIA AND PERICARDITIS.

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AND
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The high fatality-rate of streptococcal septicæmia is illustrated in the recent issue of *Guy's Hospital Reports*,[1] where, out of 21 cases recorded only six recovered. The treatment of the condition with serum appeared in this series of cases to be unsatisfactory, since out of eight cases which were treated with various brands of serum, seven ended fatally.

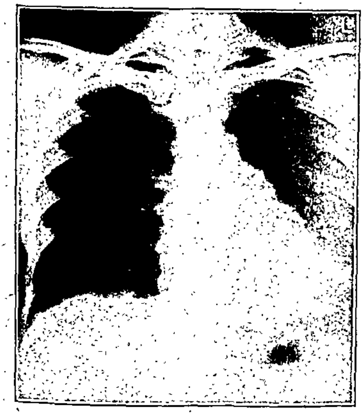
The authors of this section of the report state that there seems to be very little evidence in favour of the efficacy of serum therapy and emphasise the disadvantage of subsequent serum sickness. The occurrence, however, of serum sickness in patients treated with concentrated serum is of so little importance as to be negligible. We are inclined to think that the whole value of the treatment with serum depends on the specificity of the serum to the infecting organism. F. Griffith has described four types of scarlatinal hæmolytic streptococci, but as we have shown elsewhere [2] even in cases of scarlet fever over 53 per cent. of the types of hæmolytic streptococci found did not agglutinate with the four type sera. If, then, the serum with which the patient is treated is not specific for the infecting organism, no dramatic results can be anticipated, and if we are to regard the hæmolytic streptococci as in any way analogous to the pneumococcal and meningococcal types of organisms, the specificity of the serum administered is of the first importance. Good results have been obtained by the use of antiscarlatinal serum in the treatment of streptococcal septicæmia by Sanderson et al,[3] Burt-White,[4] Lord and Holmes,[5] Rosher,[6] and more recently by Comber.[7]

Cadham [8] claims remarkable success in the treatment of septicæmia ; out of 56 cases, of whom 38 showed a hæmolytic streptococcus in the blood, 45 recovered. He acknowledges the importance of specificity of the therapeutic serum and endeavours to obtain this by the use of multiplicity of strains of streptococci in the preparation of his immune sera. But he believes that, in addition to the use of specific sera, it is necessary to augment this treatment by the repeated transfusion of normal human serum in order to activate complement.

REPORT OF THE CASE.

The following case is of some interest because it shows that some sera will not benefit a case of septicæmia (although they are potent for certain strains of hæmolytic streptococci), while other sera will produce a dramatic cure. It is suggestive at least that the belief of Allison and Gunn [9] in the necessity of highly specific antistreptococcal sera for the treatment of streptococcal infections is well founded.

A probationer nurse at the Ilford Isolation Hospital, aged 23, was taken ill on Feb. 24th, 1930, with vague pains and pyrexia. She was at first thought to be suffering from influenza. She had a small subcutaneous abscess on the left thumb which was opened and yielded a growth of *Staphylococcus albus* and *Streptococcus viridans*. Although there was no evidence of hæmolytic streptococci in the pus, we think it was possible that the site of the abscess was the means of entrance of the organism. She, however, showed no signs of cellulitis, lymphangitis, or adenitis. The temperature was 103° F., but she showed no signs of being seriously ill. During the next day or two the pains of which she was complaining appeared to be more localised in the joints and the possibility of rheumatic fever was considered. On Feb. 29th, however, all her pain disappeared with the exception of that in her right knee which showed definite evidence of effusion into the joint. At the same time she developed pleurisy at the left base. A blood culture was taken and hæmolytic streptococci which were inagglutinable to Griffith's type sera were found.



Radiogram showing pericardial adhesion.

Her temperature which had been ranging from 103° to 101° came down to normal, but again rose on the sixth day of the disease. She was given 25 c.cm. of antipneumococcal serum and 70 c.cm. of antiscarlatinal serum (of a brand which we usually employ in our scarlet fever wards and which has given excellent results) during the next five days. Her condition gave rise to considerable anxiety; she was desperately ill with extreme cyanosis and marked dyspnœa. Oxygen was freely administered with Haldane's apparatus. The serum which had been administered had not the slightest effect upon her condition.

It should also be stated that the patient was treated from the beginning of the illness with vitamin A in the form of radiostoleum, but it had not the slightest effect on her condition. This confirms our previous views on this mode of treatment.[10]

In view of the fact that the hæmolytic streptococci which were found were inagglutinable we considered it possible that the serum which we had used was not specific for the toxin of the infecting organism, and on March 7th other intensive serum treatment was commenced. A total of 120 c.cm. of concentrated antipuerperal serum and 120 c.cm. of concentrated antiscarlatinal serum (of another brand than that administered in the first instance) were given from the 7th to the 10th. She developed well-marked pericardial friction at the base of the heart. The temperature came down to normal by lysis on March 12th and remained normal with the exception of two slight rises to 99° on March 24th and 27th.

The patient, however, showed signs of pneumonic consolidation of the lower half of the left lower lobe and also in the region of the right interlobar fissure behind, and this condition of the lungs remained stationary for a fortnight, in spite of the fact that the temperature remained normal except as stated above. This caused us to ask Dr. W. L. Yell, the Ilford tuberculosis officer, to see the case, since the possibility of pulmonary tuberculosis supervening seemed to be indicated. He, however, agreed with us that the condition was not tuberculous, and the sputum did not show the presence of tubercle bacilli. We therefore decided to desensitise the patient (this was done on March 29th) and to administer further doses of antitoxic serum. A further 68 c.cm. of antipuerperal serum and 70 c.cm. of antiscarlatinal serum were given. The general and local conditions now improved with remarkable rapidity, and signs in the chest of pneumonia and pericarditis gradually disappeared. By the 56th day the respiration-rate was normal and by the 65th day the pulse-rate had dropped to under 100. The patient made an uninterrupted recovery and was discharged on the 116th day of the disease. Three months later she returned to duty. She was then examined by ourselves and Dr. Yell who could find no signs of any lung disease with the exception of some restriction of movement at the left base. A radiogram showed that she has some adherence of the pericardium (see Figure). She has remained on duty at the hospital since and has done her work without any difficulty.[8]

On return to duty the patient was Dick tested and found to be Dick positive. It is also of interest to note that she was Dick positive on her entrance to the hospital and had been immunised.

COMMENT.

We think the following points are of interest in the case :—

(1) Difficulty of diagnosis : Ryle and Smith[1] have stated that there are four manifestations which may be regarded as diagnostic of streptococcal infection with a hæmolytic strain—namely, diarrhœa, albuminuria with red cells, rapidly progressing anæmia, and smooth red desquamating sore tongue. None of these was present in this case. The repeated rigors which are also considered of diagnostic importance and the enlargement of the spleen were also conspicuous by their absence.

(2) The importance of an early blood culture in cases of pyrexia of doubtful origin.

(3) The value of the treatment of streptococcal septicæmia with sufficient doses of concentrated antitoxic sera and the importance if one brand of antistreptococcal serum fails, of the recourse to another, our supposition being, as stated, that all antistreptococcal sera are not antitoxic to all types of hæmolytic streptococci.

(4) The ease with which such serum can be administered (in our case it was administered intramuscularly) and with which, in the event of complications developing, the patient can be desensitised and serum treatment again instituted with satisfactory results.

(5) With ordinary precautions the fear of serum sickness emphasised by Ryle and Smith is of no importance. This is the experience of observers who have been engaged in the treatment of scarlet fever with concentrated antiscarlatinal serum administered

hæmoglobin in the blood and the activity of the marrow as judged by the number of reticulocytes.—C. PRICE-JONES (London) found the normal average hæmoglobin of healthy young males in London to be 105 per cent. on the Haldane scale (with a range from 96–116), in Boston 112 per cent.; he suggested that the relative polycythæmia was due to mild chronic CO poisoning from motor engines. Women in London gave a mean of 98 with a range from 90 to 110.—R. MUIR (Glasgow) gave the result of his further investigation of Paget's disease of the nipple, which is undoubtedly due to the invasion of the epidermis about the nipple by malignant cells from a carcinoma arising in the ducts or acini.

I. BERENBLUM (Leeds) dealt in further detail with his discovery that mustard gas prevents the carcinogenic effect of tar; the influence is local and immediate, and not due to any effect of the gas on the tar.—D. F. CAPPELL (Dundee) described two unusual cases of what appeared to be adamantinoma of jaw, one of them with many foamy cells without lipoid.

L. R. W. PRICE (Glasgow) showed a rapidly growing carcinoma of the neck, believed to have arisen in a parathyroid rest or in the carotid body.—J. B. DUGUID (Cardiff) had a case of localised kidney atrophy due to tubular necrosis in a child of 4½ years.—W. A. ALEXANDER (Edinburgh) described the hæmorrhages into the rectus abdominis occurring in influenza. They occur always in the lower half of the muscle and are immediately due to violent coughing, though they are probably preceded by a change in the muscle analogous to Zenker's degeneration.—W. A. MACKEY (Edinburgh) found that in acute cholecystitis remnants of epithelium persist, from which a normal mucosa is regenerated.

DEMONSTRATIONS.

The following were also shown among the exhibits:—D. F. CAPPELL: three cases of primary carcinoma of jejunum, endosteal fibroma of fibula, leiomyosarcoma of skin. MAY H. CHRISTISON: colony variants of acid-fast and diphtheroid bacilli. S. McDONALD and R. J. WILLAN: tumours of testis. E. M. DUNLOP and H. E. MAITLAND: pleomorphic *Bacillus proteus*. J. KIRKPATRICK: methods of staining flagella. D. B. COLQUHOUN and J. KIRKPATRICK: motile typhoid glanders and plague bacilli isolated from apparently non-motile cultures. W. L. FORSYTH: *Bacterium dispar* of Andrewes. K. J. GUTHRIE: bacteriophage from sewage. J. W. S. BLACKLOCK: neuroblastoma; three tibias from the same child who twice regenerated a bone after osteomyelitis. T. RETTIE: a fresh method of staining fat with Nile blue. R. CRUICKSHANK: Zondek-Aschheim and Friedmann tests for the diagnosis of early and pathological pregnancy. G. L. MONTGOMERY: hypertrophic biliary cirrhosis. R. D. PASSEY: three spontaneous tumours in Plymouth Rocks. JANET S. F. NIVEN and R. ROBISON: calcification in vitro of embryonic rabbit bone. A. L. TAYLOR: malignant adrenal tumours; acromegaly; focal lesions in generalised vaccinia (post-vaccination death).

REVIEWS AND NOTICES OF BOOKS

Chronic Arthritis and Rheumatoid Affections.

With Recovery Record. By BERNARD LANGDON WYATT, M.D., F.A.C.P., Director, The Wyatt Clinic; Member Editorial Staff of "Acta Rheumatologica" of the International League against Rheumatism. Edinburgh: E. and S. Livingstone. 1931. Pp. 166.

So much has been published recently on the subject of arthritis and rheumatoid conditions that it is impossible for any book to contain entirely new material. But the reader interested in this disease will find Dr. Wyatt's book worthy of attention, since fresh aspects of chronic arthritis are discussed. An especially useful chapter is that devoted to joint exercises. The author gives his own methods and quotes at length from other authorities; he supplies adequate tables and offers some explanation of the value of the various movements. Another interesting section is that on climate and sunbaths. In the dry hot atmosphere of Arizona, where Dr. Wyatt is director of a sanatorium for rheumatic patients, chronic arthritis is practically non-existent amongst the residents. While sunbaths may be of great value n the treatment of chronic arthritis and fibrositis, the author condemns the indiscriminate use of solar therapy, which, in his experience, may be dangerous in certain cases. The arrangement of the material in the book is, we feel, not very well balanced. For example much space is allotted to the question of diet, which Dr. Wyatt acknowledges to be of minor importance, whereas such a fundamental section as physiotherapy is dealt with only in broad outline. The author considers his book suitable literature both for physician and patient. It is true that this is a disease where close coöperation between patient and physician is essential, but the wisdom of encouraging a patient to study a text-book on his own disease, especially when it is an intractable one, is open to question.

The book is easy to read and will provide useful information to doctors which they can pass on at their discretion. Those who find pleasure in apt sayings and quotations will reap here a rich harvest.

Treatment of Epilepsy.

By FRITZ B. TALBOT, M.D., Clinical Professor o Pediatrics, Harvard University Medical School Chief of Children's Medical Department, Mass chusetts General Hospital. London: Cassell an Company, Ltd. 1931. Pp. 308. 18*s*.

THE title of this book is misleading. It really consists of a brief account of epilepsy, and a full account of its treatment by the ketogenic diet. The author has divided the book into two separate sections, of which the second supplying valuable details of this particular treatment is discussed on p. 82 of this issue. In the first section an attempt is made to give some account of the history, incidence, ætiology, symptoms, pathology, diagnosis, prognosis, and treatment of epilepsy in 119 rather small pages. Reference is made to much of the recent work on epilepsy, and modern views on its ætiology are outlined and very briefly discussed, mostly on non-committal lines. Fortunately, this brevity is partly compensated for by an ample and admirable bibliography. But this section of the book is not nearly full enough for inclusion in a standard text-book of the disease; nor can it be placed beside other comprehensive résumés of modern work and views on epilepsy which have been produced in recent years. Nor is there much that is new in these 119 pages. Two points deserve attention here. First, the value of regular physical exercises, especially those designed to combat postural defects, is rightly stressed. Secondly, the author has travelled a long distance from the orthodox view of prohibiting marriage among epileptics. He holds that if the disease is individual rather than hereditary and the patient is able to contribute generously to the welfare of the community, there can be little objection to marriage with a healthy mate.

Even when the disease is hereditary the marriage would, in his view, be racially valuable rather than harmful if the other conditions were fulfilled, since not all the children would carry the epileptic taint, and the few abnormal offspring would not be a social burden. We cannot believe that many with an intimate acquaintance of the mental, physical, and social handicaps of epileptics would subscribe to these views.

Food Poisoning and Food-borne Infection.

By E. O. JORDAN, Chairman of the Department of Hygiene and Bacteriology, University of Chicago. Chicago: University of Chicago Press. Pp. 286. 11*s.* 6*d.*

PUBLISHED as one of the University of Chicago Science Series, this book succeeds in its aim of being accurate and scientific but not too technical. The title is used in a very wide sense, and covers subjects such as infectious disease spread by food and animal parasites, poisonous plants and animals, food allergy, metallic poisons in food, preservatives and colouring matters, milk sickness, ergotism, and lathyrism. The term "ptomaine poisoning," still frequently used, is condemned as inaccurate and unscientific. Interesting information is given on poisonous plants, some of which, such as rhubarb, are not commonly regarded as poisonous. A good account is given of mushroom poisoning. The subject of preservatives in food is discussed with common sense, and benzoic acid and the benzoates are regarded as preservatives for which a favourable case can be made out. In the United States their presence and amount must be plainly stated on the label. The author concludes: "We do not at present know what effect is produced in human beings of different ages and varying degrees of strength by the *long-continued* consumption of food preserved with particular chemicals." Excellent but comparatively short accounts are given of food poisoning from the Salmonella group and of botulism, the latter account being the more complete, no doubt in accordance with its particular importance in America. Between 1899 and 1927, according to Dr. Jordan, about 550 authentic cases of botulism in the United States were traced, and probably a considerable number were overlooked. In 1926 and 1927 there were only 6 and 11 cases respectively. An interesting account is included of toxic substances produced by certain staphylococci and streptococci which have been found associated with some outbreaks of food poisoning, much of the work having been done by Prof. Jordan or in association with him.

The volume may be recommended as a clear, accurate, and interesting volume on an important subject.

Die Primäre Verrücktheit.

Sammlung Psychiatrischer und Neurologischer Einzeldarstellungen. Vol. I. By KURT KOLLE. Leipzig: Georg Thieme. 1931. Pp. 268. M.25.

THE editors of the "Fortschritte der Neurologie Psychiatrie und ihrer grenzgebiete" could not have chosen a better work than this with which to start series of monographs. Paranoia is still one of the their most obscure subjects in psychiatry, and Dr. Kolle's painstaking investigation should do much to clear up some of the problems of this rare but important disorder. In pursuance of the modest aims stated in his preface, he has made a careful clinical. psychopathological, and genetic study of the Munich cases upon which Kraepelin based his conception of paranoia, and of others collected in the psychiatric clinic at Kiel. The work has occupied him almost exclusively since 1926, and its results are here set forth in detail so that the reader has available all the material for forming an independent judgment. Dr. Kolle's general conclusion is that these cases. judged by psychopathological and genetic criteria, represent a particular form of schizophrenia, to which he would apply Kraepelin's word "paraphrenia." His examination of the delusions, according to the method of the Heidelberg school, and his inquiry into family morbidity are well worth study by psychiatrists, as are also the admirable case-reports which comprise the second half of the work.

Vaccination préventive et curative du cobaye et du lapin contre la tuberculose humaine.

Ses indications et ses effets chez l'homme. By JULES AUCLAIR, Médecin de l'Hôpital temporaire du Bastion 29. Paris: Masson et Cie. Pp. 186. Fr.25.

La vaccination contre la tuberculose par le B C G.

By Dr. ROLAND CHAUSSINAND. Paris: G. Doin et Cie. 1931. Pp. 196. Fr.38.

THE basis of Dr. Jules Auclair's book is to be found in the employment of a special tubercle vaccine devised and prepared by himself. It consists of tubercle bacilli, either virulent or killed by heat, treated for several days with extract of the pancreas of the fowl at a low temperature. The details of the preparation of this vaccine as given here are extremely scanty; a little more information about it will be found in an article written by Dr. Auclair four years ago.[1] Several series of experiments with both types of vaccine in guinea-pigs and rabbits are described and the preventive and curative vaccination of these animals against *B. tuberculosis,* together with the use of tubercle vaccine in man, is discussed at some length. As a result of his experiments, Dr. Auclair concludes that guinea-pigs can be completely healed of tuberculosis by his vaccine, but if a weak dose of vaccine is used healing will take place only if the disease is but slightly advanced at the time of inoculation. Among rabbits the process of healing is said to take place more readily, and even in advanced cases. With regard to vaccination of man the author is cautious, stating that more prolonged clinical studies must be made before he can come to any definite conclusion; but he states that healing does take place in cases with external tuberculous lesions such as lupus, and cutaneous tuberculosis. In other cases, if vaccination takes place at the time of infection or soon after, Dr. Auclair believes that even if it does not always heal the lesions, at any rate it confers some degree of resistance and immunity for a long time. The book concludes with a very short bibliography.

Since Calmette first introduced his now well-known B C G vaccine there must have been little short of a thousand papers published of one kind and another dealing with the subject. Several collective reviews have been made in various journals, and now Dr. Chaussinand, evidently a disciple, epitomises practically all of the earlier work and many of the more recent papers. There is nothing new in the monograph. The conclusions reached by Calmette are clearly set out and a really excellent bibliography, probably the fullest that has yet been issued, is appended. We can recommend the book as a clear presentation of the claims of the Calmette vaccine, and the reader who makes use of it will be saved a vast deal of trouble in hunting up references to an enormous literature which has accumulated since Calmette's original paper was published in the Annales de l'Institut Pasteur in 1926. The reader who studies the book alongside the account given by Calmette himself in "L'infection bacillaire et la tuberculose," of which the third edition appeared in 1928 (Paris, Masson et Cie) will find himself possessed of practically all the information on the subject up to the beginning of 1930. The book contains a preface by Prof. Calmette.

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[1] Presse Médicale, 1927, i., 353.

Diagnosis and Treatment of Venereal Diseases.

Second edition. By David Lees, F.R.C.S., M.R.C.P. Ed., Surgeon in Charge of Venereal Diseases, Edinburgh Royal Infirmary. Edinburgh: E. and S. Livingstone. 1931. Pp. 634. 15*s.*

The second edition of Mr. Lees's book for students and practitioners is sure of a welcome, for it is not merely a text-book, but rather an exposition of the methods used in hospital practice and teaching by a practical man who is also an enthusiast about his subject. Modern methods of diagnosis and treatment of venereal diseases are clearly explained and where possible tabulated, so that the amount of treatment required for patients at any stage of syphilis can easily be grasped. A new chapter is supplied on cardiovascular syphilis, and the section on syphilis of the nervous system has been revised and supplemented.

The diagnosis and treatment of gonorrhœa are well described. It is of interest to note that Mr. Lees, in common with a good number of workers in venereal diseases, has been unable to obtain by local diathermy, either in males or in females, such good results as did Cumberbatch and Robinson, who strongly advocated this method.

A misprint or an omission in the first lines on p. 80 mars the otherwise admirable section on differential diagnosis of syphilis. The book contains 87 illustrations, over 70 of them being photographs of actual lesions. The colour photographs are particularly vivid.

This volume is a reliable and important addition to the bibliography of venereal disease.

A Text-book of Histology.

By Alexander A. Maximow, Late Professor of Anatomy, University of Chicago. Completed and edited by William Bloom, Assistant Professor of Anatomy at the University. London: W. B. Saunders Co., Ltd. 1930. Pp. 833. 40*s.*

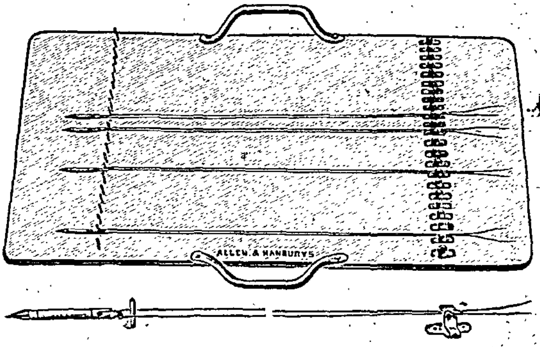
To general pathologists as well as to histologists the name of Maximow suggests original and erudite work. When he died in 1928, at the early age of 54, Maximow was writing a book of histology, and he had already progressed far with the work. He had completed the sections on the male and female generative organs, the urinary tract, the organs of special sense and epithelium, and he left in manuscript form the sections on the blood and connective tissue, the gastro-intestinal tract, the blood vascular and lymphatic systems, the spleen, the integument, and the mammary gland. Prof. Bloom, after Maximow's death, undertook the task of completing and editing the work. In this he was assisted by Prof. Herrick, who contributed much to the section on the nervous tissue, by Dr. N. Hoerr, who wrote the description of the suprarenal bodies, and by many others of Maximow's colleagues, including Prof. Bensley. Some assistance in the method of dealing with the various sections was moreover obtained from the 1918 Text-book of Histology in Russian. The final product is worthy of the name under which the book appears, and Prof. Bloom deserves gratitude for the way he has accomplished his task. Readers will naturally turn to the descriptions of the blood and connective tissue, since Prof. Maximow was an acknowledged authority on these subjects. They are clearly and convincingly written. No less sound in their teaching are the various parts of the book which have been written by the editor and his colleagues. The work is well illustrated and a few well-chosen key references to recent important works are inserted.

The book should take a leading place as work for reference and as a text-book for the advanced student.

NEW INVENTIONS

A TRAY FOR RADIUM NEEDLES.

The tray shown in the illustration, which has been made to my specification, has proved useful for carrying radium needles that are threaded prior to sterilisation. It is of metal, 15 inches long, and including the side handles, 12 inches broad; the angle at which the handles are placed enable it to be completely immersed in 1 inch of fluid. Each needle with its thread is held by a peg and a spring clip, of which there is a row of 24 near each end of the tray. The needles, after being threaded, are placed so that one of the double threads issuing from the eyes passes over each side of a peg; the threads are then pulled taut and fixed in the corresponding clips at the other end of the tray. The pegs and clips are placed so as to take threads of not less than 10 inches in length, but the tray can of course be made so as to accommodate needles with shorter threads. If the threads are knotted a little distance from the needles, it is simpler to draw the knots, rather than the eye ends of the needles, up against the pegs. The advantages of this tray are that on each one 24 needles can be carried, sterilised, and counted with ease and convenience, and with a minimum amount of handling. Entanglement of the threads is avoided, and only a very small depth of fluid is required for sterilisation—an important point if this is effected by immersion in spirit.



The tray has been made for me by Messrs. Allen and Hanburys, Ltd., Wigmore-street, London, W.

Edgar Freshman, F.R.C.S.

London Hospital.

THE LANCET.

LONDON: SATURDAY, JULY 11, 1931.

THE CENSUS OF 1931.

TEN years ago, in these columns, it was our pleasant duty to commend the Registrar-General for such prompt publication of the preliminary results of the thirteenth census. The record then established of a summary made public within three months of a collection of the returns has been beaten, for the preliminary results of the census of 1931 have appeared this week, while the returns were not available until the end of April. The total population enumerated at midnight on April 26th, 1931, amounts to 39,947,931 persons, the largest number hitherto recorded in the history of census-taking in this country, exceeding the numbers returned at the census of 1921 by 2,061,232 persons, and corresponding to an intercensal increase of 5·52 per cent. This percentage increase, however, with the sole exception of the increase noticeable for the decade 1911–1921, is only the half of any previously recorded. But the low rate of increase will come as no great surprise to students of the vital statistics of this country familiar with the substantial reduction year by year in the national birth-rate. The total births registered during the decennium 1921–1931 are no less than a million and a quarter fewer (or 16·3 per cent.) than the numbers recorded during the period 1911–1921—a period, it will be remembered, when the birth-rate declined to the lowest level ever recorded in this country. In this connexion the Registrar-General comments: "The full significance of the fall will be but dimly appreciated for many years to come; any temporary satisfaction felt in a reduction of the number of unproductive mouths to be filled during the present period of economic distress must sooner or later be qualified by a realisation of the profounder secular issues involved. The births of to-day govern the population of the future; and just as the nation which faced the upheaval of 1914 to 1918 was the product of the birth-rates prevailing towards the close of the last century, we are now observing the conditions which will shape the generations charged with the national destiny in the latter part of the present century." This unprecedented fall in the number of births during the decade is partially compensated for by the fact that, during the period under review, the numbers of deaths recorded were more than half a million fewer than those recorded during either of the two preceding decennia; in other words, allowance being made for the increasing age and numbers of the population exposed to risk, these figures represent a reduction in mortality of about 20 per cent. by comparison with the mortality figures for the decennium 1911–1921.

Turning to consideration of population variations in geographical sections of the country, in each of the regions selected for tabulation, with the single exception of South Wales, the population of 1931 in each section exceeds that recorded in 1921, the variations ranging from an increase of 10·5 per cent. in the South-Eastern Section, to a decrease of 3·6 per cent. in South Wales (Region W.1). It is significant to note that the areas associated with mining and the heavy manufacturing industries, which showed the largest population growths during the period 1911–1921, now find themselves, notwithstanding the higher birth-rates characteristic of these areas, relegated to the bottom of the list of increases of population during the decade 1921–1931. There are manifestly steady, though comparatively small, increases in the urban as compared with the rural elements of the population, though, in the opinion of the Registrar-General, "the latest record suggests almost that rural development is now materially in excess of urban." According to the preliminary figures, the population of the Administrative County of London has decreased by 2·0 per cent., while that of Greater London has increased by 9·7 per cent., and now totals 8,202,818 persons. The Registrar-General comments at length upon these changes, and is of the opinion that the London area is growing, not at the expense so much of rural areas as of the provincial towns, particularly those of South Wales and of the North of England. Of 1120 urban administrative areas, 113 had enumerated populations exceeding 50,000 in 1931, and these in the aggregate accounted for one-half of the total population of the country. Thirteen new areas find themselves included in the category of great towns. In the London area West Ham, East Ham, and Leyton all show decreases of population; the same is the case in Lancashire, in towns such as Barrow-in-Furness, Burnley, Salford, Wigan, Blackburn, Oldham, Bolton, and Rochdale; and in South Wales, in the Rhondda and Merthyr Tydfil; while seaside resorts like Eastbourne, Great Yarmouth, and Hastings show decreases of 7·4, 6·5, and 1·9 per cent. respectively.

The preliminary report concludes with brief reference to the ratios of males to females for the country as a whole and for individual areas. Here it is seen that sex distribution varies widely in different parts of the country—no novel feature, for relative positions of different areas have not been profoundly affected by any changes in proportions. The greatest preponderance of females is to be found in the South-Eastern Metropolitan region, while at the other end of the scale lies South Wales, where the males outnumber the females—though here it is to be remembered that the male excess is now lower than it was in 1921. The figures are, of course, provisional, but judging by past experience no material discrepancy is to be anticipated between those now before us and the results which will appear in the final census volumes. They provide a foretaste of the valuable data concerned with tracing the eddying tides of humanity which only a vast national stock-taking can provide.

THE FUNCTIONS OF A MEDICAL SOCIETY.

Dr. Raymond Crawfurd, in his opening address at the Harveian Society's centenary[1] stated that the functions of a medical society were, primarily, the diffusion of knowledge; as a necessary preliminary to that end the acquisition of existing knowledge, and (to a limited extent) the creation of new knowledge. Different societies, according to their particular constitutions and needs, perform these functions in different ways along different lines, the difference being chiefly in scale and method. We publish in the correspondence columns of this issue communications from three medical men who, from their interest in collective medical effort and the services that they have rendered to it, are exceptionally well qualified to speak on this subject. "A," in a comprehensive survey of existing medical societies, suggests a classification into three groups according to degree of specialisation, with hospital societies as a fourth group. He points out that the work of diffusing knowledge from the centre to the periphery is performed by meetings and discussions, by the publication of transactions, and by the maintenance of special library and translation services. He especially stresses the value of clinical meetings, asserting that the medical society affords to the practitioner a unique opportunity of securing advice on difficult cases, of enlarging his clinical knowledge and of developing his intellectual power by the difficult work of presenting cases. The general practitioner, he states, must possess a rich harvest of clinical material, and medical societies offer an easy and ready medium for the propagation of this knowledge. He observes rightly that one of the most promising roads of advance in medicine lies in the careful and accurate observation, annotation, and presentation of clinical work. He commends also the intimate friendly atmosphere of the small local society, a point which is taken up again by "C" in his insistence on the value of the collective expression of the views of local practitioners in any area. "B," on the other hand, emphasises the value of tradition, which he holds to be the chief element in the success of at least one hospital society. The traditional interest taken by students in the society ensures, he says, a much more active discussion by all ranks than is usually heard elsewhere. The meetings which are successful at other societies are, he writes, those at which some great contributor to medical knowledge (or his deputy) discusses his own work. Turning to a few small but very important details, he urges upon the executives of societies to ensure that foreign speakers are properly interpreted; that all speakers be made to speak up, and that all lecturers who illustrate their remarks should make sure that their illustrations are boldly set out and plainly visible at the back of the room. He points out that the value of a clinical evening can be much enhanced by the skilful selection of a small number of cases, so as to present a wide field of interest.

Dr. Crawfurd and our correspondents have between them left very little to be said about medical societies. It is perhaps arguable that they do not attach full weight to a factor which may be more important than anything else. Admittedly medical societies fulfil an indispensable work in propagating knowledge in printed form, whether it be in their own transactions or in books and periodicals. Nevertheless, in all the functions of a medical society the factor of personal contact is the one which supplies the dynamic. It is possible that a few research workers derive their creative inspiration from themselves or from one or two intimate contacts, but for most men the incentive to create, to collect, and to diffuse knowledge arises from the desire to serve, to strive with, and to emulate their fellows. A solitary job is to most men a hard discipline, an obligation rather than a pleasure. The member of a live medical society—and more so the member of two or more societies—feels that his job is not solitary; that he shares it with many others whose minds are like his own. Every member of a lively medical society has a real chance of attaining that invaluable prize, a life-long working friendship with one whose approach to life and medicine is absolutely congenial to his own. This consideration explains the importance of tradition, stressed by "B," for tradition is transmitted personal influence. It explains the intrinsic interest, also mentioned by "B," of a lecture by one of the great masters of the art and science of medicine. It explains the unique value of the clinical demonstration, and interprets more kindly than Dr. Crawfurd the attraction of the dinner meeting extolled by "A."

Moreover, it throws a sidelight on the rule of an old Gloucestershire Society, quoted by Dr. Crawfurd, that no new member should be admitted for seven years to come whose age exceeded 40—a rule with which Dr. Crawfurd hinted his sympathy and "B" expressed his profound concurrence. It is true that the official administration of societies tends to get far too much into the hands of the older members. Nevertheless, there are many men even under 40 whose appointment to office would not contribute greatly to the animation of a society, and many of advanced age whose deposition under such a rule would be an irreparable loss. Surely in the sphere of personal dynamism, as in that of the intellect, age is not measurable by years. Just as the "mental age" of many persons never exceeds 12 or 14 to the end of their days, so the social age of many valuable and venerable officers of medical societies remains always at a vigorous prime. The influence of the best, such as Hunter and Harvey, has survived to this day.

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SOCIAL PSYCHIATRY.

Those who try to educate the public in mental hygiene stress the high percentage of recoveries in mental hospitals and the importance of early treatment. They are also courageously working along many different lines to teach the far more difficult lesson that the only sound way to mental hygiene is preventive. This ideal will be stimulated by study of the Morison lectures for 1931.[1] Dr. D. K. HENDERSON argues with vigour and sound reason. His comprehensive essay contains much controversial matter but will bring encouragement and stimulation to all who read it, however much they disagree with some of the author's contentions.

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[1] The Lancet, June 13th, p. 1275.

One of the points which will provoke discussion is the plea that mental hygiene should be placed on the same footing as physical hygiene, in line with the control of infectious diseases and the betterment of living conditions. To this end Dr. HENDERSON urges the centralisation of control in public health officials. He wishes to extend the term "public health" beyond its essentially physical meaning of to-day, to cover all means for preventing mental disease and defect. It is often argued that the aggregate recovery-rate in the mental hospitals of the country shows no appreciable tendency to rise, and that therefore psychiatry is making no progress. Even the Board of Control, he remarks, has expressed itself as disconcerted, and suggest that the reason lies in the more rigorous standard of recovery now demanded. In his view the reason is that, like all other hospitals, the mental hospitals are dealing with end-results, much damage having already been done. "We must get in at the beginning," he says; "medically, socially, economically, it is better to centralise on the recoverable than to care through a lifetime for those whose illness has been allowed to develop past all chance of betterment." Psychiatry he regards as a social and public health problem, to be debated in the clear light of day rather than behind the high walls of an institution. It needs the coöperation of all, medical and lay, who really have at heart the welfare of humanity, and unlike the study of tuberculosis or sanitation, psychiatry is intensely individual and personal and strikes at the liberty of the subject. This broad conception of psychiatry passes over in its first stride those who are already cared for in mental hospitals and institutions for the mentally deficient and concentrates attention on the socially inefficient, the unemployable, the epileptic, the habitual offender, the prostitute, and all others who have not been able to fit themselves harmoniously into the fabric of society. In the words of Dr. O. LEWIS, "the problem of mental inefficiency . . . must be one of the major social problems which a civilised community may be called upon to solve." Dr. HENDERSON insists vehemently that all forms of disordered conduct are due to inability to adapt; that institutions are very limited in their possibilities, and that a much more hopeful approach is to tackle those who have not yet developed any outspoken defect. Every case of disordered conduct must undergo an exhaustive examination to determine the relative importance of the various ætiological factors, hereditary and exogenous, and how they can be modified. He strongly condemns the fatalistic attitude of those who explain every aberration on an hereditary basis and abandon hope for the inefficient who has an alcoholic uncle or some relation who is a ne'er-do-well. He holds KRAEPELIN's view that heredity is a fact of experience, not a law which holds in every case. The avoidance of the propagation of defective stock, is, he protests, a matter for the individual conscience and not for legislation; the public should be educated to realise the tribulations which it brings to both parents and offspring. Rather than allow the sterilisation of defectives, he would strike at alcohol and venereal disease. He approves of our comparatively mild restrictive legislation on alcohol, but recognises that a greater factor in its control has been the higher standard of living and the more rational outlook which has grown up in this country. The public are understanding more and more clearly that alcoholism interferes with efficiency and brings distress, and public education must be directed to spread this knowledge. Venereal disease should, in his view, be combated along the same lines.

Dr. HENDERSON does not spare his colleagues. Side by side with efforts to educate the public and reconcile psychiatry with public activities, the profession must, he insists, put its own house in order and marshal its ranks more closely. Instead of maintaining an obscurantist attitude to psychiatry and keeping the psychiatrist in the background as an ogre with which to frighten recalcitrant patients, all ranks of the profession should make an effort to acquire a working knowledge of psychiatry. To this end he advocates the more comprehensive training of the medical student and closer coöperation between the general hospital and the more specialised departments of medicine. The student should be given a clearer idea of the normal and should be made familiar with the danger-signals and the early cases. Specialisation may prevent the conception of the patient as a whole by its over-emphasis on physical health. As machinery for the advancement of mental hygiene in the community, he desires nursery clinics, where children up to the age of five can be observed; child-guidance clinics for the maladjusted older child; and out-patient clinics for mental patients, in association with general hospitals and in close coöperation with schools, charitable organisations, law courts, industrial concerns, and mental and general hospitals. He does not hold it necessary to wait until a certain number of beds are provided in the general hospital; the establishment of more clinics of all kinds would, he thinks, create a further demand for the type of clinic that proves most useful. Every local mental hospital could offer some help in the way of coöperation with the local general or cottage hospital. The thesis of these lectures is that a psychiatric clinic for both in-patients and out-patients is the keystone of the psychiatric arch. With such clinics, numerous on the Continent and in America, this country is still inadequately supplied.

PRINCESS ALICE MEMORIAL HOSPITAL, EASTBOURNE. During a visit to Eastbourne last week the Prince of Wales laid the foundation-stone of the new buildings of this hospital.

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[1] Edin. Med. Jour., May, 1931.

ANNOTATIONS

DISCIPLINE UNDER N.H.I.

INSURANCE committees and approved societies are fully justified in drawing attention to the cumulative evidence of the abuse of national health insurance benefits. In so far as medical practitioners may be found to blame, the medical profession has a strong incentive to join in restraining any wastage of the approved societies' funds. Those who favour the principle of salaried service will be helped in argument if the panel practitioner shows himself careless of the prescribed Terms of Service which he has undertaken, or half-hearted in his resistance to pressure from insured persons. Public opinion, it is safe to say, is as yet no more attracted by the idea of a salaried service than is professional opinion. But if avoidable abuses continue, and if the Minister of Health is driven to take drastic action, that idea is certain of advancement as a potential remedy. It therefore seems worth while to re-examine the situation somewhat closely. For this purpose we offer on p. 87 a study of a sample of the disciplinary work under the National Health Insurance Act as revealed in a single sitting of the London Insurance Committee.

THE KETOGENIC DIET FOR EPILEPSY.

THE method of treating epilepsy by the ketogenic diet is not easy to master, nor is its theoretical basis established. The process of maintaining a ketogenic ratio, once established, by food adjustment is laborious for the physician and the cook, and unpalatable, if not actually unpleasant, for the patient. Is it worth it? Dr. F. B. Talbot, in a book reviewed elsewhere in this issue, quotes the results obtained by himself and three other observers, covering in all a series of 208 epileptic children at the Massachussetts General Hospital. In rather less than 40 per cent. of these children, application of the diet was followed by complete relief of symptoms. Among adults, a lower percentage must be expected. It is agreed that the method must be thoroughly understood and conscientiously carried out, or left alone altogether. The only definite contra-indications would appear to be a low grade of mentality, or an unwillingness to coöperate on the part of the patient. The degree to which the diet should be pushed, and the duration of the treatment are indicated by the fit incidence. If the protein and vitamin content of the diet are carefully watched, and a small dose of calcium be added as a precaution, Dr. Talbot believes that prolonged ketosis has no prejudicial effect on growth or development; nor need treatment be interrupted in the case of intercurrent disease. He gives a clear account of the metabolic processes involved in the production of ketosis and of the maintenance of the requisite ketogenic ratio by food adjustment. Once the principles have been grasped, their application is made easy by an admirable series of tables. The normal height and weight of children of various ages and of adults are given, and the important point is made that in calculating caloric requirements, the normal weight of a patient of the given age and height should be taken. Otherwise the obese child will receive extra calories which he does not need, and the thin child be deprived of calories which he does need. Once the total calorie requirement has been determined by this and other considerations in the individual case, the daily ration of protein, fat, and carbohydrate needed to arrive at the ketogenic ratio aimed at can be calculated from a special table derived from previously unpublished data by Luther and Bartlett. Tables are also supplied to show the composition of the various foods, together with their ash and vitamin contents, and finally a series of complete specimen dietaries, so that all the material for building up a diet on this basis is here provided.

Why the ketogenic diet should prevent the occurrence of attacks is not known. Whether acetone or some other product of incomplete fat metabolism has a specific action, whether the diet causes a shifting of the acid-base balance in the blood or a lessening of its CO_2-combining power, or whether the lowered blood-sugar content is a factor—these things remain a mystery at present. The position as to blood-sugar is anomalous in that ketosis with a lowered blood-sugar prevents fits, while the rapid hypoglycæmia that follows insulin injection often gives rise to fits. In the June issue of the *Bulletin* of the Johns Hopkins Medical School, Dr. E. M. Bridge and Dr. L. V. Job discuss the mechanism by which the ketogenic diet acts. They incline to attribute the benefit to the régime to the removal of extracellular fluid from the body, and to intensify this action they recommend a preliminary fast of five days' duration before starting treatment, water only being allowed. No one who has studied the recent work of J. L. Gamble, I. McQuarrie, and Temple Fay can ignore the importance of dehydration in the treatment of epilepsy. As Dr. Talbot himself points out, low salt diets, shift of the acid-base balance of the blood towards the acid side, the production of ketosis, whether by fasting or by the use of a special diet, limitation of the fluid intake, and the use of cathartics are all procedures which have, or have had, the reputation for controlling epileptic attacks, and they all have one common effect on the tissues, dehydration. It may well be that the elaborate calculations and devices that are involved in the production and maintenance of ketosis achieve their object in epilepsy solely by lessening the body fluids. If this be so, we may hope that some method more simple and more congenial to physician and patient alike may come to hand.

MATERNAL MORTALITY AGAIN.

THIS year, for the first time, the National Conference on Maternity and Child Welfare was held elsewhere than London, the place selected being Cardiff. The fine City Hall provided an admirable setting for the meetings, any acoustic defects having been largely obviated by the use of microphones. The Principality was well represented among speakers. The presidential address was delivered by Mr. John Rowland, Chairman of the Welsh Board of Health. Speaking of maternal mortality, he said that to those who talked about the "irreducible minimum of maternal deaths" or the "normal order of things" he commended the study of the interim report of the Committee on Maternal Mortality and Morbidity, published last year. From the investigations there recorded it appeared likely that at least one-half of the deaths among women in childbirth could be prevented if conditions were more favourable. Efforts must extend in many directions. The obstetric training of *medical students* must be improved *and* the midwifery service developed. There must be more antenatal supervision, and consultants and hospital beds must be available for the difficult cases. There was room also for extended educational measures, wisely directed, to inspire the patient with confidence. He welcomed the presence of the conference, especially as a stimulus to Welsh endeavour, for the maternal mortality-rate of Wales is about 40 per cent. higher than that of England. This may be partly accounted for by the rugged, mountainous nature of the country, the sparsely populated areas with difficulty of transport, and the exceptionally hard conditions under which the industrial population in the mining valleys of the south are living.

Speakers at the conference showed a notable consensus of opinion in favour of giving the general practitioner a central position in any national maternity service. Dr. Gilbert Strachan (Cardiff) pointed out that all the schemes put forward by different groups of people have much in common, all concentrating on the necessity for improved obstetrical education of medical students and midwives, the importance of antenatal supervision, the necessity for more hospital accommodation for maternity cases, and a proper consultative service. Sir Ewen Maclean (Welsh National School of Medicine) and Mr. J. Bright Banister (London) both deprecated indiscriminate and ill-considered criticism of the medical profession, pointing out that teachers of obstetrics have been fighting for generations to obtain a larger proportion of the students' time for obstetrics and gynæcology. Sir Ewen Maclean suggested that the real difficulty of shortage of teaching material might be partly met by a system of conjoint teaching of medical students and midwives, to the advantage of both. Mr. Banister, while emphasising the importance of a postnatal examination within three weeks after childbirth, expressed his belief that it is erring on the side of too much protection to insist on regular postnatal supervision for every patient, though, of course, any disablement complained of should be corrected. Too much may, he thinks, be made of slight anatomical deviations from the normal which in no way incapacitate a woman from being a useful member of society. Similarly, Dr. W. G. Savage (Somerset), speaking at a joint meeting of the Association of Maternity and Child Welfare Centres and the National Baby Week Council, questioned the need for submitting every pregnant woman to two antenatal examinations by a doctor. The danger of creating a pathological atmosphere, detrimental to the patient's peace of mind, must not be ignored. He holds the midwife to be the pivot of the maternity service, and therefore lays great stress on improving her capability and status. In Somerset he has introduced a system of flying clinics, under which an experienced woman obstetrician visits any district to which she is called by a midwife or health visitor for help or advice. Dr. Thomas Evans (Swansea) thought that in towns a more efficient service would be secured by the employment of specialists rather than general practitioners, basing his argument on the satisfactory results obtained in certain institutions and districts where teams of specialist workers have carried on large practices with a maternal mortality-rate of under two per 1000. Dr. F. Ivens-Knowles (Medical Women's Federation) emphasised the importance of skilled antenatal care, and said that an investigation of many institutions showed that the mortality was ten times as high among those of the patients admitted as emergency cases who had not had such care before admission. A number of speakers called attention to the fact that safe childbirth depends on other factors besides obstetrics. Dr. Garland Collins (West Ham) mentioned the prevalence of drug-taking on the part of women and its disastrous effects; Dr. G. C. M. M'Gonigle (Stockton-on-Tees), whose paper was read by Dr. Ralph Picken, attributed particular importance to the nutrition of the expectant mother, and had had encouraging results from antenatal administration of vitamins A and D to the women. Dr. Dunstan Brewer (Swindon) emphasised what previous speakers had already indicated, that the presence or absence of confidence exercises a powerful influence on any woman's chances of a successful and uneventful labour. His views, with those of Mr. Bright Banister and Dr. Savage, noted above, are shared by all experienced obstetricians and midwives, and suggest that constant reiteration of the high mortality and morbidity associated with childbirth has its dangers. While it may be desirable to stimulate public concern, in order that more money shall be available for social services to combat these evils, the prospective mother is likely to be disheartened. It is impossible to represent a process as physiological while at the same time insisting that for months before and after, as well as during, parturition, the woman must be under constant supervision. There is sound sense in the view that postnatal attention should be reserved for those who complain of any disablement.

THE LIMITS OF PREVENTIVE MEDICINE.

It is refreshing, in times when the jargon of health propaganda far outstrips its accepted principles, to hear a medical officer of health admit that the greatest obstacle to the successful practice of preventive medicine is our lack of knowledge. At the Congress of the Royal Sanitary Institute, held at Glasgow this week, Dr. Ralph Picken, of Cardiff, showed that whatever the aspirations of local authorities, the contribution of the newly acquired municipal hospitals to preventive medicine must at present be confined mainly to the provision of opportunity for scientific research and teaching. The most that can be done is to provide ample accommodation for observation in the attempt to detect at an early stage conditions which are curable only if treated before they have reached a crucial phase. Dr. Picken pointed out that in all countries far more money is spent, and under present conditions must be spent, on the curative than on the purely preventive medical services. Even in Russia, where the revolution was followed by a determination to alter the old bias in the direction of prevention, the distribution of funds for health work in 1925 was 77 per cent. for hospitals and out-patient departments against 23 per cent. for protection of motherhood and infancy, sanitary and hygienic education, sanatoriums, campaigns against contagious diseases, psychiatric treatment, and so forth. Even a communist state then had evidently found it necessary to spend most of its available funds on treatment, in spite of its lip-service to prevention.

In order to ascertain the type of case for which provision must be made in municipal hospitals, Dr. Picken reviewed first the demands made on the poor-law hospitals which they replaced, and, secondly, the waiting list on May 11th, 1931, of the Cardiff Royal Infirmary, on the assumption that this waiting list would be typical of voluntary hospitals of this class. The Royal Infirmary (apart from its convalescent home and a maternity branch) contains 380 beds, of which only 105 are in medical wards. It is thus not because an undue proportion of beds are allocated to medical treatment that only 24 patients are awaiting admission to medical, against 1543 to surgical beds. The great majority (77 per cent.) of waiting patients suffer from diseases such as hernia, hæmorrhoids, appendicitis, gastric and duodenal ulcers (52 bound for surgical, only eight for medical wards), cataract, chronic diseases of the ear, nose, and throat, and endocervicitis and allied disorders. It is in the relief of such patients, for whom voluntary hospitals will always find it difficult to provide enough accommodation, that Dr. Picken sees one of the main functions of the municipal hospitals, for in the widest connotation of the word such treatment is preventive, if only of more acute disorders. If all medical officers of health advise their authorities in this sense, coöperation between the two kinds of hospital should lead to the foundation of a science of preventive medicine on a broader basis than has hitherto been possible and to its speedy development.

THE JEWISH DENTAL CLINIC.

THE annual report of the work of the Jewish Health Organisation appears under the title "Public Health Work in the Jewish Community." It includes many interesting activities such as public lectures, inspection of evening schools, and the well-known child-guidance clinic. It is satisfactory to learn that the society has been restored to solvency and even provided with a surplus. The most recent development is a dental clinic for adolescents, which was opened on Nov. 20th last. The committee felt that much of the valuable work of the school dental service failed in its object owing to the lack of supervision for adolescents. Even when the young person is old enough to join the National Health Insurance scheme, dental benefit is only provided by some approved societies, and then after an interval of several years. The Jewish dental clinic, called the "Prunella Treatment Centre," holds sessions in the evening after normal working hours in an attempt to fill this gap in the health service of the country. Patients are seen by appointment, and every member under the scheme is inspected at least once a year. Inspection and treatment are combined with dental hygiene education. The clientèle is obtained through societies and clubs, the affiliation fee being provisionally fixed at a shilling a year, with a minimum of £2 per institution. The clubs are visited by the dentists to give talks on oral hygiene and to make inspections and arrange appointments for those requiring treatment. Already seven clubs have been visited and 166 young people examined. Of these no fewer than 161 required treatment, thus indicating the need for the service.

SUPRARENAL CORTEX IN ADDISON'S DISEASE

THE discussion on hormones and the diseases of the ductless glands at the recent meeting of the Association of American Physicians centred largely on the effect in Addison's disease of the potent hormone extracted from the suprarenal cortex. Attempts to elucidate the inter-relation of the adrenal and the thyroid glands by giving the extract to patients with Graves's disease were also described. So far, however, the effect on these patients seems to have been mainly subjective—i.e., they felt better but their metabolic rate was unchanged. With regard to Addison's disease not much progress seems to have been made since we last commented on this interesting work.[1] Papers were contributed by Dr. W. W. Swingle and Dr. J. J. Pfiffner, of Princeton, who described the method of extraction which they have found to be the most effective after extensive trials, and by their various clinical collaborators. There seems still to be considerable difficulty in obtaining an adequate supply of the extract and treatment has had to be discontinued in urgent cases for lack of it. Dr. L. G. Rowntree recorded the use of this treatment in 20 cases of Addison's disease, with five deaths. Two patients who had adequate treatment did not respond. Those who improved showed gain in weight and strength, disappearance of anorexia, nausea, and vomiting, decrease of pigmentation, gain in sleep, change of outlook, and desire to go back to work. The hormone was administered intravenously, the dosage being 3·5 c.cm. in a day. The preparation used by him had some tendency to sensitise the patients to adrenalin. Dr. G. A. Harrop (Baltimore) reported definite improvement with the extract in three cases, Dr. Allbright (Boston) in one case, while Dr. T. R. Boggs (Baltimore) described his success in one case with the whole gland, administered in a capsule insoluble in the stomach. The patient was a Scotch woman living in Jamaica, and her pigmentation had been so deep as to cause social embarrassment to her husband. Within four weeks after beginning treatment, which also included large doses of calcium, the blanching of her skin was considerable and a report received after her return to Jamaica was satisfactory. Dr. Rowntree reiterated his belief that the extract from the cortex is a potent remedy for Addison's disease, specific though not infallible, but he emphasised the need for many more records of cases before this form of treatment can be evaluated.

EMBRYONIC INJURIES.

THE late Dr. T. S. P. Strangeways evidently had a sure instinct when he saw towards the end of his life that tissue culture was likely to be a valuable weapon in experimental pathology. Under the guidance of Dr. H. B. Fell a number of valuable researches on normal growth and the mechanism of calcification have come from the laboratory which he founded. One of these is a singularly interesting contribution[1] by Dr. Janet S. F. Niven on the healing of wounds in the rudiments of bones, isolated from the embryo and allowed to grow and differentiate in tissue cultures; what the tissues do is therefore determined by themselves and is not subject to any influence from the rest of the embryo. If the femur from a five-day chicken embryo is cut across and the ends left in apposition, the wound is healed at once by proliferation of the cartilage cells and in 24 hours no trace of the cut can be seen or found in histological preparations; later on, normal differentiation of the cartilage occurs and bone begins to form in the usual way. In the early stages, therefore, cartilage cells have a remarkably high capacity for repair. But this is soon lost. If a femur rudiment from a six-day embryo is similarly divided across the shaft, the cartilage immediately adjacent to the cut undergoes some change which makes it opaque instead of semi-translucent, and although the two halves of the rudiment go on differentiating normally the cartilage does not unite. The site of the cut remains obvious and is outlined on either side by a zone of degenerated cartilage cells. The fragments are united and an effective mend made by proliferation of the periosteal cells and the neighbouring connective tissue, aided sometimes by an ingrowth of the osteoblastic layer of the periosteum and the production of osteoid tissue. The embryonic limb in fact does what the adult body does; if it cannot achieve its end by one means it does it by another. In rudiments from older embryos in which a bony sheath is already present the cartilage takes no active part in repairing a fracture. Indeed the osteoblastic tissue which comes in through the gap takes an active part in bringing about the absorption of the cartilage, which can take place without the invasion of blood-vessels.

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[1] See THE LANCET, 1930, i., 652.

[1] Jour. Path. Bact., 1931, xxxiv., 307.

The further development of these injured rudiments proceeds in a normal way and a continuous sheath of periosteal bone completely covers the site of the injury. The morphological differentiation is also normal, and from an injured rudiment of, for instance, the femur a properly shaped bone emerges with head, neck, and condyles as they should be. In the chances of tissue culture it often happens however that the two fragments are not in perfect alignment and the shaft into which they develop is in consequence curved. It is of exceptional interest to learn that the formation of periosteum and osteoid tissue is considerably greater in the concavity than on the convexity of the head—an observation which is difficult to harmonise with the common belief that the similar condition seen in rickets is due to pressure from use.

THE CONTROL OF MALARIA IN SOUTH AFRICA.

We learn from a South African correspondent that Prof. N. H. Swellengrebel, of Amsterdam, who was called into consultation by the Government of the Union of South Africa for advice on the presence and conditions of endemic malaria in Natal and the Transvaal, has presented an exhaustive report. He is hopeful that malaria control in South Africa will be achieved more simply and cheaply than has been anticipated. The main carrier of the disease in the Union, *Anopheles costalis*, is, fortunately, highly selective in its breeding places, choosing muddy pools and drains open to the sunlight in preference to swamps, morasses, and rivers. This predilection makes the control of breeding places an economic possibility. Whereas it was feared that larvicides would have to be used lavishly over the whole countryside, Prof. Swellengrebel believes, as the outcome of careful investigations, that paraffin applied to comparatively few selected spots, easily identified, is likely to check the spread of the disease. One of the major recommendations is the use of malaria-tolerant native labour, to be drawn from highly malarious areas where investigation has shown that only the children suffer from the disease, adults being immune. A corollary of this recommendation is that no steps should be taken to reduce the incidence of malaria in these areas. Prof. Swellengrebel makes it clear that his advice is based only on present knowledge; any policy adopted must be flexible, since new facts materially altering the outlook may be revealed by research, which must be actively pursued. He estimates that malaria control in Natal will cost the sugar industry one-quarter per cent. of its gross income—an infinitesimal sum compared with the losses the disease has already caused the industry, and will continue to cause if not controlled. He points out that antilarval measures, although indispensable for the complete eradication of malaria, should not be regarded as the only means available for control of the disease in South Africa, and that there was no reason for discouragement if further experience should prove the impossibility of their general application. Besides *A. costalis* and *A. funestus* a third anopheles, *A. pretoriensis*, had once been found to be infected. This species breeds in swamps, and if subsequent research shows it to be a potent malaria-carrier, the methods of combating infections will be greatly complicated. It is likely, however, that the outcome of investigations now being made will confirm the evidence hitherto available, that the species is not a dangerous vector of malaria in South Africa. Among Prof. Swellengrebel's recommendations for Natal are the organisation of health committees, a centralised medical and hospital service for the whole sugar belt, a system of medical examination of recruited labour, government help for the provision of malaria-tolerant labour, an adequate quinine distribution, and instruction on malaria in native schools. For the Transvaal he proposes a unit for malaria control and research, a field station for malarial control, instruction of the public in general, especially of school-teachers and farmers' wives, by district surgeons and district nurses, and finally that natives in epidemic areas should be trained, as they are now trained in Natal, to initiate treatment in native reserves and to promote a knowledge of malaricology. The report makes it amply clear that no dread of malaria need prevent the settlement of people of European descent in any part of the Union otherwise suitable for their reception.

A PORTRAIT OF DR. ALFRED COX.

It is intimated that Dr. Alfred Cox will retire from the position of Medical Secretary to the British Medical Association, which he has long occupied with distinction, at the centenary meeting of the Association in London next year. A group of the Association are arranging for the painting of a presentation portrait, and a general meeting of these members will be held on Saturday, July 18th, at Eastbourne, to elect an executive committee with the usual officers, and decide upon the organisation for the collection of subscriptions.

A SHORT COURSE IN TROPICAL MEDICINE.

The authorities of the London School of Hygiene and Tropical Medicine announce that they are about to modify the post-graduate course in tropical medicine. The five-months' course of intensive study hitherto in force, followed by examinations first for the certificate issued by the school and then for the Diploma of Tropical Medicine of the Conjoint Board, has been found to impose an undue strain upon candidates. Many of the colonial governments have found it difficult to release their medical officers for a sufficiently long period to enable them to combine what is in effect six months' study-leave with a much-needed holiday in this country. Further, the requirements of the colonial service are so urgent that a demand has arisen for a short course of instruction for recruits about to proceed overseas. After consultation with the Colonial Office and the Conjoint Board, it has been decided to divide the course of study into two parts: a three-months' course of clinical and laboratory instruction and a two-months' course in tropical hygiene. Each course can be taken independently, and the Conjoint Board is arranging for an examination to follow closely upon each course of study. The internal school examinations will be discontinued, and students will be encouraged to sit for the diploma examination. Application has been made to the University of London for recognition of the revised course. The new three-months' course includes clinical tropical medicine, applied pathology, medical zoology, and elementary bacteriology; the two-months' course includes instruction in the relation to tropical hygiene of bacteriology, medical zoology, anthropology, and vital and medical statistics. In order to meet the requirements of the modified course, the school has established a new division of clinical tropical medicine which can call on the combined resources of the Seamen's Hospital Society. The innovation will undoubtedly fill a need, and the facilities offered should make it easy for many more medical men and women to learn or revise the groundwork of tropical medicine, pathology, and hygiene.

CONTRIBUTORY SCHEMES AND HOSPITAL BENEFITS.

Whether a hospital contributory scheme should or should not guarantee definite benefits to the contributors is one of the most interesting problems which arises, if only indirectly, from a study of the replies received to a questionaire recently issued by the Central Bureau of Hospital Information.[1] It is not stated how many questionaires were despatched to those responsible for the management of contributory schemes and to hospitals interested in their establishment, but 456 replies were received, of which 126 were non-committal; 330 replies were thus available for analysis. Those replying were classified into four groups, of which Groups I. and II. embraced views based on experience of existing schemes, run respectively by outside organisations (Group I.) or by the hospitals themselves (Group II.); in Groups III. and IV. were included expressions of opinion from hospitals not at present associated with any contributory scheme, but favouring outside or inside management, respectively.

The questions asked included, among others, (*a*) the limits of income, if any, imposed on contributors; the majority favour a limit of £6 a week; (*b*) the weekly contribution—2*d*. or 3*d*. are the most popular figures; (*c*) the desirability of making payments out of funds raised by contributory schemes to members of honorary medical staffs; of those answering this question 109 objected to any such payment, while 41 agreed to the principle that payments might be made. In a number of schemes, however, the medical staffs are allowed to charge fees to all patients, whether contributors or not.

The most crucial of all the points at issue, however, arises indirectly from the question: On what grounds should the invitation to become a contributor be based? The subdivision in the classes (*a*) and (*b*) of each of the four groups is based on the replies to this question, of which samples are given. Broadly speaking, those advocating appeals on the grounds of insurance against illness in the future, of making sure of free treatment and maintenance in hospital for self and dependents, should illness occur, as well as on altruistic grounds naturally fall in each group into class (*a*), which provides, or aspires to provide, definite benefits to contributors; while those who advocate appeals entirely on altruistic grounds belong in each group to class (*b*) —those promising no stated benefits. It is interesting to note that of the 330 organisations classified 212 fall into Groups I. and II.—organisations with existing schemes—and among these 113 offer definite benefits, 99 offering no stated benefits. Groups III. and IV., hospitals with schemes only under consideration, include 118 hospitals, of which as many as 86 contemplate or recommend schemes offering definite benefits, only 32 believing in schemes which carry no stated benefits. It is recognised that the contributor may in any case have no legal right to treatment; but when the benefits of joining a contributory scheme are definitely stated, as they are in the leaflets issued in connexion with a large number of schemes, there can be no doubt that such statements provide some inducement to join. Where such inducements are offered it must be a matter of actuarial calculation, when data are available, whether a weekly contribution of, say, 3*d*. a week is adequate to meet the benefits offered.

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[1] Memorandum 38. Obtainable from the Director, Joint Council House, 12, Grosvenor-crescent, London, S.W.

ANNUAL HEALTH REPORTS FOR 1930.

We publish in this issue the first group of notes on the annual reports of medical officers of health for 1930. They have an unusual interest since 1930 marks the eve of a new period of hope. Important legislation, notably the Local Government Act of 1929, began to operate on April 1st, 1930, while the Housing Act of 1930 and the Mental Treatment Act 1930, came into operation on Jan. 1st, 1931. Under the Local Government Act, the magnitude of the task of county councils and county borough councils must vary greatly, according as to whether they succeed guardians of the progressive or conservative type. Judging from the first reports to hand from the county boroughs the transfer of duties is taking place smoothly. The county councils have a task which will operate much more gradually. On all sides there is a desire to secure harmonious working with the voluntary hospitals and so to get the best possible value out of each hospital for the community. Under the Housing Act a determined attempt is to be made to get rid of slums and to rehouse the slum-dwellers. The five-year housing programmes, which are due from each local authority, will be studied and their progress followed by many not directly concerned with the district. Under the Mental Treatment Act it will be found that many authorities had in readiness for Jan. 1st, 1931, arrangements designed to bring close coöperation between mental and general hospitals, such as the establishment at general hospitals of mental out-patient clinics conducted by experts, and the provision of hospital wards for voluntary and temporary mental patients without the stigma involved by certification. The Registrar-General has not made his usual estimate of the populations for this the last year of the intercensal period. We shall shortly know how far the estimate used in 1929 and previous years deviated from actuality. Doubt was thrown on the accuracy of the last census from the beginning owing to the fact that it had to be taken at the end of June, and involved estimates of the holiday movements of the population. Several medical officers of health have always preferred to use locally made estimates and it will be instructive to see whether they or the Registrar-General have been nearer the mark.

Liverpool Royal Infirmary.—With a total of 336 beds, 6850 in-patients were admitted last year, which, for the seventh year in succession, constitutes a record. Their average stay was 15·25 days, and their average weekly cost £2 15*s*. 10½*d*. There were 51,267 out-patients, again a substantial increase; they cost 4*s*. 5¼*d*. per head. The average cost per occupied bed was £145 13*s*. 7¼*d*. The total income of £51,925 fell short of the expenditure by £2646, and the accumulated deficit on the general account is now £35,805.

PANEL AND CONTRACT PRACTICE

PITFALLS OF PANEL PRACTICE.

A SAMPLE OF COMPLAINTS.

THE following paragraphs summarise a batch of 12 cases taken from the published proceedings (No. 6, dated June 25th) of the London Insurance Committee sitting to consider the Report of the Medical Service Subcommittee. Of these dozen cases, which give a cross-section of the panel doctor's work, five relate to allegations of irregular certification or other breach of regulations, five to complaints of delay or inadequacy of treatment, and two to minor matters. The broad result is that one practitioner is found grossly negligent, is severely censured and heavily penalised by deduction; two others are found to have broken the Terms of Service and are penalised in a lesser degree; the rest are either exonerated or not found so seriously to blame as to merit penalty. Even a brief summary of the cases must be somewhat diffuse if it is to show fairly the incidents and the different points of view upon which the London Insurance Committee is passing judgment. Reasons for setting them out in detail are given in our annotation columns.

COMPLAINTS OF IRREGULAR CERTIFICATION.

Of three instances in our sample one is an approved society's complaint that an insurance practitioner gave an insured person's wife a certificate dated March 3rd though he had not seen the patient for a fortnight. At the hearing it appeared that other certificates had been given irregularly. The practitioner said he had seen the patient on certain dates, but the patient's wife could not remember the particular days of his visits beyond the first two or three; she said she had herself been to the surgery to obtain certificates for her husband. The practitioner, whose good faith the Committee accepted, said he understood the local agent of the approved society called at the insured person's house every Wednesday and that the patient was concerned to obtain a weekly certificate on the previous day in order to substantiate the claim to weekly payment of benefit; in giving the certificates, his sole object was to assist his patient to obtain his money. The Committee points out that Rule 9 of the Medical Certification Rules forbids the practitioner, having issued a certificate under the Rules, to issue another without again examining the patient. This, they justifiably observe, is the essence of the system of certification under the Act—viz., that a certificate shall be issued only on a fresh examination of a patient. The facts were admitted as to three certificates. The practitioner's explanation was not accepted as an excuse for a violation of the Rules; he failed properly to appreciate that the certificate contained a statement of fact and he could not have been ignorant that he put his signature to statements which were not true. He committed a breach of the Rules and consequently also of the Terms of Service for Insurance Practitioners. He is to be warned of the necessity of strict adherence to the Rules and the Minister of Health is asked to withhold a sum of £2 from the money payable to the Committee with a view to that amount being deducted from the practitioner's remuneration.

Another instance related to three certificates dated Feb. 16th and 23rd and March 2nd issued by a panel doctor to the insured person's daughter without his having seen the patient within the previous 24 hours. The proceedings stated that the doctor seemed to think all would have been in order if he had inserted the date of the examination as well as the date of signature; he appeared not to be acquainted with the provision in the Medical Certification Rules that a certificate should be given either at the time of the examination or within 24 hours afterwards. He had also broken Rule 9 in giving a further certificate without a fresh examination. The Committee ascertained that the approved society agreed that there was no doubt that the patient was in fact incapacitated from work. The Committee did not question the doctor's good faith; it appreciated that he had signed merely in order to assist the patient to obtain his benefit and to have the necessary document available when the agent of the society called. As in the instance already mentioned, the practitioner is to be warned of the necessity of strict adherence to the Rules and there is to be a deduction of £2.

The third instance concerned a First Certificate issued by a practitioner's assistant, not bearing a stamped impression of the practitioner's name and address as required by Rule 7 (4) of the Medical Certification Rules. The Committee seems to have accepted the doctor's explanation (that this must have been due to his assistant's misunderstanding) and his assurance that the assistant had now been given adequate instructions. There was a further point as to a Final Certificate, personally given on Tuesday, March 31st, indicating that the insured person would be able to resume work on the following Monday. The approved society informed the insured person that, under the Regulations, it could not accept this certificate as a "declaration off" for Saturday, April 4th. The patient then submitted a Voluntary Certificate (Form Med. 40 F) in which the doctor said he had examined the patient on April 6th and that the patient remained incapable of work up to that day; this Voluntary Certificate was dated April 18th. The practitioner at first said he thought he must have filled up the Final Certificate of March 31st in error for an Intermediate Certificate. At the hearing he withdrew this explanation and said that, on further consideration, he thought that when he saw the patient on March 31st he found the patient's inflamed leg nearly well and believed the patient would be quite fit to resume work on the following Monday; he thought he must have realised that Tuesday, March 31st, was in the week before Easter and he must have had in mind the question of covering the holiday period. As to the statement in the Voluntary Certificate that he examined the patient on April 6th, he had accepted in all good faith the insured person's statement in this report and had assumed that the patient must have been seen by his assistant on that day. The Committee finds that he contravened Rule 6 which allows the doctor, if of opinion that a patient is not fit to resume work immediately but will be able to do so on the second day after the examination (in urban areas), to issue a Final Certificate and to enter in the appropriate space on the certificate the date when he thinks the patient will be fit to resume work. In the case under review the doctor issued the certificate on a Tuesday and intimated that the patient would be fit no less than six days later. Impressed, however, by the practitioner's frankness, by his assurance that this was the only certificate he had given of this nature, and by his statement that in giving certificates he does not allow himself to be governed by any but medical considerations, the Committee finds no other action necessary except to impress on him the need of strict compliance with the Rules.

DEFAULT IN KEEPING RECORDS.

In one case the Minister of Health drew attention to a panel doctor's failure to keep proper medical records of the diseases and treatment of his insured patients as required by Clause 9 (12) of the Terms of Service. A Regional Medical Officer examined 223 record cards and found that only eight cards (or 3·58 of the whole) bore entries of attendances or visits for the year 1930. The Minister has considered exercising his power, under Article 41 of the Medical Benefit Consolidated Regulations, of withholding an appropriate portion of the practitioner's remuneration, but thinks it possible that the practitioner has not appreciated the full extent of his duties. No action is therefore taken at present except to warn the doctor that his cards will again be inspected in the coming 12 months and that, if they are then found improperly kept, a substantial sum may be withheld

QUESTION OF ASSISTANT.

One case, referred by the Medical Benefit Sub-committee, arose over the question of deduction from the practitioner's remuneration by reason of his having been without an assistant for part of the first quarter of the year 1931. The facts were apparently admitted and the practitioner seems to have agreed to the withholding of an appropriate sum. He had employed an assistant, with the Committee's permission, in a practice which showed 2678 insured persons on his list at the beginning of the year. His remuneration was calculated on the number stated. The assistant left his employ on Feb. 12th; no other assistant had been engaged and there appeared no intention to engage another until the end of September. He had been without an assistant for about one-half of the first quarter of the year, and he recognised that he was not entitled to remuneration for the whole of the quarter in respect of the additional number of insured patients included in his list by virtue of his employment of an assistant. The amount in question was £5 12*s.* 9*d.* and this is to be withheld. No question arises as to his remuneration for the second and third quarters of 1931, as the practitioner will be paid for these on the full number of insured persons on his list if the figure does not exceed the maximum permitted by the Allocation Scheme; if it does, his remuneration will be calculated on the maximum number.

COMPLAINTS OF DELAY AND INADEQUATE TREATMENT.

The five instances of complaints that a panel practitioner has been dilatory or inadequate in treatment of a patient are necessarily more vague than the foregoing instances where some specific allegation of a breach of rule or regulation has been in question. Disputes about treatment will naturally vary widely with the disputed facts of particular cases. The patient's relatives are unlikely always to agree with the practitioner as to the exact degree of urgency represented to him. It is easy to be wise after the event. In our first instance of this class a patient visits the doctor's surgery on the evening of Feb. 23rd complaining of general pains. The insurance practitioner's partner (called "Dr. A" in the proceedings) finds him slightly feverish and diagnoses influenza; he gives a certificate of incapacity on this ground next day. The patient's son says the doctor promised to call and see his father; the doctor denies the promise and the Committee thinks it very likely that no such promise was made. The patient remained in bed; nothing happened till Feb. 27th when he appears to have developed a form of delirium. His wife being ill in the house with bronchitis and pneumonia, his daughter, the only adult then available, became alarmed and sent for the police. The son was also called and found his father shouting and singing. The police sent him for his father's doctor. He went to the surgery at 8 P.M. (where patients were waiting), saw the dispenser and asked if the doctor could come at once as the case was urgent. The dispenser told the son to see the doctor personally and take his turn in the surgery. The son waited 20 minutes before he reached the consulting-room. It was not clear what happened next. The son said he told Dr. A his father was delirious and was going mad and that the police were in attendance; Dr. A denied that delirium was mentioned. The doctor seems to have said that he "did not deal with madmen" and that he did not "take orders from the police." The son went away; the police sent for the relieving officer; the patient was taken forthwith to hospital and died there on the 29th from pneumonia. The doctor had called at the house two hours after receiving the request, but had not told the son he would call. The Committee had to consider the allegation of the doctor's delay in responding to an urgent request for his services. The evening hours at the surgery were from 7 to 9.30; the doctor was very busy at the time and had to decide whether to interrupt work at the surgery or to defer his visit till that work was finished. Was the two hours' delay unreasonable? The Committee finds that Dr. A committed an error of judgment in not going to the patient earlier, but the incident is held to fall short of amounting to a failure to comply with the terms of service. The Committee adds that arrangements for dealing with urgent cases at this surgery should be improved, urgent messages should be brought to the immediate notice of the doctor on duty, that Dr. A was not so considerate or careful in inquiry as he should have been, and that this led him to make the error of judgment laid to his charge.

Another complaint of delay was complicated by the circumstances that the patient was dead when the doctor was summoned and that there is no Regulation which requires an insurance practitioner to attend for the purpose of viewing a dead body. The wife of the patient had gone to the surgery one evening and reported her husband seriously ill "being unable to breathe without great difficulty." She obtained a prescription for him but did not think it necessary that the doctor should call. Next morning the patient was found dead in his bed. A neighbour went to tell the doctor and the widow took a second message at 7.30 A.M. The practitioner replied (through a maidservant) that he could not call immediately and in any case could do little since he could not certify the cause of death; he would have to inform the coroner. An hour later the widow brought a note expressing doubt whether her husband was dead. She was informed that the practitioner had gone out and she was advised to obtain the services of another doctor The practitioner received the note later in the day but not before he had called at the patient's house. The Committee, though strictly perhaps exceeding its jurisdiction since admittedly there is no legal obligation on an insurance practitioner to attend a dead man, expresses the view that the common practice of the medical profession and the ordinary dictates of humanity suggest that a doctor would not hesitate to pay a visit even after the patient's death for the peace of mind and comfort of the relatives. In this sense the Committee thinks there was delay and that the practitioner's explanation is unconvincing; but it is unable to find that the Terms of Service were infringed.

Another instance concerns a patient, aged 22, who had often been under the care of the insurance practitioner and his assistant (called "Dr. A" in the report) for gastric trouble. Early one Sunday last April the patient had an attack of severe pain in the stomach and told his father. The father had to go out to work; on returning and finding his son no better, he went to the surgery and saw Dr. A about 6 P.M. No request was made for a visit; the possible cause of the trouble was discussed and Dr. A prescribed a bismuth mixture and aperient pills, asking to be informed of the patient's condition next day. On the next evening Dr. A was sent for; he interrupted his surgery work to pay the visit. He examined the patient, prescribed, and again asked to be kept informed. He had a report next day and gave further advice. On the day following, Dr. A was telephoned for, visited the patient and advised his removal to hospital where intestinal obstruction was diagnosed. An operation was performed and strangulation of the small intestine was revealed. After the operation the patient collapsed and died; the coroner found death due to toxæmia following intestinal obstruction, combined with the shock of the operation. At the inquest the patient's father and mother for the first time expressed dissatisfaction with Dr. A's conduct, complaining that he did not call on the Sunday night. The Committee however finds that the father did not request a visit on that Sunday but was satisfied with a prescription. The Committee accepts Dr. A's statement that he would have gone if asked; it points out that he did go promptly twice when requested. Yet, while admitting that it is easy to be wise after the event, the Committee cannot entirely exempt Dr. A from criticism for not seeing the patient on the Sunday evening before prescribing. It is emphasised that the Terms of Service oblige a practitioner to visit any patient whose condition so requires. This means that a patient must be visited at his home, if his condition requires it, even though no request is made. Prescription without seeing the patient is naturally deprecated, though it is recognised that here Dr. A had previous knowledge of the patient's type of illness and was led to infer a recurrence. The Committee decides that there was no failure to comply with the Terms of Service.

Judged by the penalty, the gravest case before the Committee was one in which the practitioner discontinued treatment without warning. A lad, temporarily residing in London, was on the list of a doctor in Surrey. He was taken ill on March 4th and was visited next day. His mother explained his position in insurance; the boy's medical card was handed to the practitioner but not taken away by him. Influenza was diagnosed and an insurance certificate of incapacity on that account was given. On the 6th the doctor visited the patient and recommended removal to hospital; the mother demurred, saying she felt quite capable of looking after her son. That evening the mother sent a message reporting pain and asking for something to relieve it; the doctor advised a plaster and promised to call next day. He did not call till a day later (the 8th) when pneumonia was found to have developed. The mother had raised the question on the 6th of having the services of a district nurse but the doctor thought this unnecessary. On the 8th the question of a nurse was again raised; the doctor advised how to obtain a nurse and a nurse was obtained. The doctor promised to call next day but did not; the nurse advised he should be sent for. The doctor told the messenger (the patient's uncle) that he was too busy but would come the following day (the 10th). On the 10th the uncle visited the surgery as an insured person to obtain a certificate for himself. The practitioner asked him to tell the mother that he did not intend to call any more. The mother with difficulty obtained another doctor who ordered removal to a hospital. The mother reported the facts to the Surrey Insurance Committee, who referred the case to the London Committee. As her report did not mention that her son had gone to hospital, an officer of the Committee telephoned to the insurance practitioner on the 12th, the case being treated as one of an insured person requiring treatment urgently. The practitioner called at the house and found the patient had been removed. The patient died on the 17th. The Committee finds that the practitioner thought he could wash his hands of the case because his original advice (that the patient should go to hospital) had been ignored. The Committee observes that, whatever he might do with his private patients, he had a definite obligation to provide treatment for his panel patients. The offence of discontinuing treatment in the Committee's view becomes gross "negligence" (as defined in Article 41 (5) of the Medical Benefit Regulations) when the practitioner gives no warning that he has given up the patient and when he ignores an urgent request. The Committee has seriously considered a representation for removal of the practitioner from the panel but contents itself with the finding of gross negligence and a recommendation of severe censure and the withholding of £50.

The last instance of alleged inadequate treatment is trivial and was disposed of without a hearing. A patient consulted her panel doctor for digestion trouble; he found her suffering from a septic molar tooth, prescribed for her, and advised a visit next day when he diagnosed stomatitis and said she would require dental treatment. That afternoon she consulted a dentist who is said to have expressed surprise at the practitioner's "incomplete diagnosis." She then consulted another doctor who, she said, told her her temperature had risen to 102° and advised her to go to bed. She sought to recover expenditure amounting to 31*s.* incurred during her treatment by the second doctor. The panel practitioner said that a possible cause of the sudden rise of temperature was influenzal catarrh, then prevalent; if the patient had informed him of this development, he would have seen her; but she did not give him the opportunity. The Committee observes that the patient thought the examination incomplete because he had not used a thermometer—as though the thermometer was the only means of determining a raised temperature. It finds that there is no reason to think the practitioner did not exercise proper care; the cost of treatment by the second doctor is therefore not recoverable.

OTHER CASES.

One of the two remaining cases in this sample of a dozen can be quickly dismissed. The patient's employers made a complaint but did not pursue it. The other case arose out of a doubt whether it had been represented to the insurance practitioner that the patient was an insured person. He treated her for tonsillitis, charging a fee of 8*s.* 6*d.* (paid at the time of the consultation), which included 1*s.* for a private certificate. The Committee finds that on the first day of the treatment the doctor was not told that the patient was insured; he therefore did not violate the Terms of Service. Exercising its discretion under Clause 7 (3) of the Terms of Service, the Committee directs the refund of 7*s.* 6*d.* and the crediting of the practitioner with the remuneration he would have received if he had attended the patient as a temporary resident. The sum of 7*s.* 6*d.* excludes the payment for the private certificate.

CONCLUSIONS.

These sample cases must represent a very small percentage of the total satisfactorily treated by insurance practitioners in the period and area concerned. We must not be content, however, to observe that it is a relief to find they are not more serious. The object of those who take part in the national health insurance system must be to avoid all possible cause of complaint. It will be useful to remember the Committee's views on particular points—e.g., that the duty to visit a patient is not excused merely because a visit is not expressly requested, that prescription without seeing the patient is strongly deprecated, and that the normal medical practice and the dictates of humanity may oblige a doctor to visit relatives for their comfort of mind though the patient is dead and though there is *no statutory duty*. But the most easily avoided matters of complaint are the direct breaches of a clear rule or regulation in such things as record-keeping and certification. The insurance practitioner must study the rules of the system which he undertakes to work; certificates are valueless if irregularly given; a member of an honourable profession will not put his name to statements which are not true. A casual and slovenly attitude towards certification, even though an element of fraud be absent, is dangerous for two reasons. It undermines the public faith in the medical profession which is entrusted with considerable responsibility in this respect by the State; it also exposes the individual practitioner to disciplinary action at the hands of the General Medical Council, of whose Warning Notice he cannot plead ignorance.

SPECIAL ARTICLES

REPORT OF THE BOARD OF CONTROL.

MENTAL HEALTH IN 1930.

THE passing of the Mental Treatment Act in July of last year and the steps taken to bring it into operation are naturally regarded by the Board of Control as the most important events of the year under review in their seventeenth annual report.[1] The report summarises the Act and remarks that some time must necessarily elapse before the effect of its far-reaching changes is felt, and calls for the coöperation of the public, the profession, and the local authorities to bring its benefits fully within the reach of those for whom they are intended. The Board's own steps to bring the Act into effective operation include a conference of representatives of local authorities last summer, a circular and memorandum to local authorities, and various explanatory circulars for local authorities and voluntary hospitals. The Board has given approval to licenced houses and nursing homes for a period of one year only, in order that special facilities for the intensive treatment of voluntary and temporary mental patients may be provided before the approval is renewed. The Board requires that every such house or home shall have a qualified mental nurse on its staff, and has also been concerned with the approval of special practitioners under the Act; up to March 31st last it had approved 2209 of these. The Board itself has been reconstituted, with five senior commissioners and 11 junior commissioners, on whom the task of visiting will principally devolve.

An inquiry into the working of the Act during the first two months of this year show, as would be expected, a very uneven provision in different areas. On the whole the figures are not unsatisfactory, but the Board considers the moment too early for either congratulation or disapprobation. The development of out-patient clinics is a most gratifying feature, perhaps because the difficulties of organisation are smaller than in other new ventures. The Board is particularly pleased that voluntary hospitals are showing willingness to appoint the superintendent of the local mental hospital a member of their staff, and hope that local authorities will reciprocate by appointing the honorary staff of the voluntary hospital consultants at the mental hospital. This interchange of staffs is an advantage, not only to the patients but also to medical education, clinical research, and the investigation of the problems of all departments. The Board is most anxious that teaching hospitals should admit voluntary cases in the earliest stages in order that students may learn to recognise incipient mental disease.

The Mental Hospitals during 1930.

The increase in the number of patients in public mental hospitals during the year was 2410, an increase that may be regarded as normal and that may be anticipated for some years to come. It does not, however, indicate any real increase in the incidence of mental disorders; it reflects the increase in the general population, a change in habits by which there is greater readiness to seek institutional treatment for old people who would formerly have been nursed at home, and the better feeding and more assiduous care which has diminished the death-rate in mental hospitals. The Board can find no justification for the suggestion that the conditions of modern life are conducing to mental breakdown.

Nevertheless, the increase is a matter of grave concern on account of the dangerously narrow margin of accommodation available. On Jan. 1st last there was, in the aggregate, overcrowding on the male side amounting to 452 beds and on the female side to 1635 beds. There were only 27 hospitals with 10 or more vacant beds on the male side and 19 with 10 or more vacant beds on the female side. Only two new mental hospitals are being built; one for Swansea and Merthyr and one for Middlesex at Porters Park, but Southend and East Ham are seeking a site for a joint hospital. The only hope of new beds in the immediate future is through the provision of admission hospitals and convalescent villas. The surplus accommodation rendered available by a re-allocation of poor-law institutions has proved to be much less than was anticipated. The Board stresses the lamentable effects of overcrowding, and points out how small an item in the budget of a local authority is the expenditure on public health services compared with that on highways and education. It hopes that, despite the difficult times, local authorities will realise the gravity of the situation and make plans for meeting it. It deplores the continued existence of mental hospitals without separate admission and convalescent units.

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[1] London: H.M. Stationery Office. 1931. Pp. 169.

RESEARCH, SOCIAL SERVICE, AND NURSING.

The Board has given much consideration to the problem of research in mental hospitals and is most anxious that the work should be properly coördinated. An advisory committee is therefore being established; local authorities will be represented and expert assistance will be given by the Medical Research Council's Committee on Mental Disorders. Not less important, in the opinion of the Board, is a link between the work of mental hospital laboratories and that of universities and medical schools.

The Board regrets very much that in some areas the offer of voluntary organisations to assist with social service has been refused by the local authorities. The Board thinks it desirable that the voluntary spirit should be preserved and that this work should not be wholly professionalised, although in the larger area it is desirable to have a nucleus of trained and paid workers. Social work and after-care cannot, of course, be separated, and the real problem is the recruiting and training of the right type of worker.

The Board strongly approves the appointment of one local committee to deal with the mentally defective and with the mental hospitals. This will, however, greatly enlarge the work of the committee, and it is essential that some effective liaison be secured between this body and the Public Health Committee.

Many hospitals still find difficulty in securing probationer nurses, and the Board thinks that more might be done in the way of propaganda, through coöperation with the educational authority and perhaps also with the labour exchanges, to obtain selected candidates from distressed areas. The standard must not be lowered, for that will only increase the difficulty. The Board now has an inspector fully trained in both general and mental nursing, who is available for consultation on any deficiency in the arrangement of the hospitals which may deter nurses from joining or remaining in the service.

THE FIGURES FOR 1930.

On Jan. 1st, 1931, the number of notified insane persons under care in England and Wales was 144,161. The males were 44·1 per cent. and the females 55·9 per cent., a decrease of 0·1 in the proportion of males. Private patients numbered 14,404, rate-aided patients 128,846, and criminal patients 911. The recovery-rate for the year was 32·93 per cent., 29·87 per cent. for males and 35·38 for females. This is an increase of 0·87 for males and 0·72 for females above the rate for the previous decade. The death-rate of 6·71 per cent. is the lowest on record, being 1·33 below that for 1929. The rate was 7·43 per cent. in males and 6·13 per cent. for females. The alterations and extensions that received statutory approval during 1930 include admission hospitals at Denbigh, Banstead, and Hull; nurses' homes at Denbigh, Severalls, Chartham, Springfield, Netherne, East Sussex, the East Riding of Yorkshire, Bristol, and Leicester City; convalescent or other villas at Denbigh, Brookwood, Netherne, West Sussex, Winson Green, and Portsmouth; extensions of ward space at Long Grove, Salop, Netherne, Brighton, and Bristol; additions to other buildings at Cumberland and Westmorland, Brentwood, Netherne, Lancaster, and Cheddleton. The number of post-mortem examinations held in county and borough mental hospitals was 5404, being 68·8 per cent. of the deaths. The percentage varied from 90 or more at some hospitals to 17 and 15 at others. The total expenditure on county and borough mental hospitals, during the year ending March 31st, 1930, amounted to £8,148,752, of which £7,028,845 represented maintenance. This was an increase of over £90,000 in the cost of maintenance and over £80,000 in the cost of building and repairs, compared with the preceding financial year. At the beginning of 1930 there were 1209 patients under treatment for tuberculosis, a proportion of 10·3 per 1000 of the total number resident. The highest incidence is in Notts County, Middlesbrough, Cumberland, Derby County, Cotford, and Northumberland, obviously to some extent a geographical distribution. The death-rate from this disease has been reduced to 6·3 per 1000 patients resident. Suitable quarters for tuberculous patients are being provided in an increasing number of mental hospitals, but there are still some for whom appropriate accommodation is inadequate.

There were 106 cases of typhoid and paratyphoid fevers, a decrease of 14 on the previous year. Two epidemics were traced to a polluted water-supply. The number of cases of dysentery—254—was reduced by nearly a third from the previous year. A great deal of time and work has been devoted to the discovery of the source of intestinal infections, particularly carriers. One instructive case was found to carry not only typhoid but also dysentery and another diarrhœal disease. Attention has also been directed to new admissions who may introduce infection. An increasing number of hospitals practice protective inoculation. There was less influenza last year than the year before, and the fall in pulmonary tuberculosis was coincident.

Mental Deficiency.

The progress on the mental deficiency side has been more satisfactory than the figures might suggest, and the Board records with approval a marked awakening of local authorities to the wisdom and necessity of carrying out their duties in this branch. At the present time 53 county councils and 61 county boroughs are seriously and actively considering some scheme for residential provision, while only 10 appear to have taken little or no action. Three new institutions were opened during the year and 1255 additional beds provided. If schemes recently submitted materialise, some 10,000 extra beds will have been provided in about five years' time, and the Board estimates that at this rate it will be possible, with active, continuous, and prolonged effort, to meet the demand for the most urgent of the young trainable and employable cases in about 15 or 20 years. The committee, under the chairmanship of Mr. Walter Hedley, K.C., has now presented its report on economy in the provision and maintenance of homes for the defective. It did not succeed in cutting the requirements of the Board much finer. The Board realises that the cost of construction is of real importance in the development of colony policy, and is glad to note that there has been a steady fall; the cost may now be taken at about £300 a bed, this including all the administrative buildings of a complete colony.

The Board regrets that occupation and industrial centres are not being developed more rapidly to help parents who are both willing and able to keep their mentally defective children at home but cannot provide them with suitable occupation and training. It has been proved repeatedly that the initial difficulties in the establishment of day centres can be overcome and that these centres meet the needs of the situation in an inexpensive and efficient manner. The Board thinks that it is not yet generally recognised that all defectives—except the lowest grade idiots—benefit from training, and that without it even the best behaved are apt to degenerate.

Another important provision in which there has been no increase during the year is that of hostels for defective boys and girls whose training has fitted them for work outside an institution. The hostel forms an invaluable link between the institution and the community and saves the advancing defective many unnecessary disasters.

The increase in the number of defectives ascertained by local authorities has been maintained and the ratio per 1000 is now 2·17 as compared with 1·81 a year ago. The report, as usual, lists areas in which ascertainment seems to be inadequate and gives some illustrations of the terrible results of failure to ascertain. It reviews the methods of community care afforded by the Mental Deficiency Acts and the extent to which they are being carried out by local authorities. Once again the problem of marriage and sterilisation comes up for discussion, and once again the Board strongly recommends prohibition of marriage and feels that there is not as yet sufficient knowledge to justify even the most cautious legislation for sterilisation.

The Board urges again the separation of defectives from psychotics, but the shortage of provision for the former means that mental hospitals still have a large number of defectives in residence, an arrangement which is essentially bad for everybody concerned. On Jan. 1st, 1931, there were 55,064 mental defectives under care, 2120 of them under guardianship or notified.

The report concludes with a brief review of research work in mental hospitals; this will be dealt with more fully in the second part of the report, to be published later in the year.

INFECTIOUS DISEASE

IN ENGLAND AND WALES DURING THE WEEK ENDED JUNE 27TH, 1931.

Notifications.—The following cases of infectious disease were notified during the week:—Small-pox, 48; scarlet fever, 1427; diphtheria, 882; enteric fever, 31; pneumonia, 552; puerperal fever, 49; puerperal pyrexia, 99; cerebro-spinal fever, 40; acute poliomyelitis, 4; acute polio-encephalitis, 1; encephalitis lethargica, 10; continued fever, 1; dysentery, 21; ophthalmia neonatorum, 110. No case of cholera, plague, or typhus fever was notified during the week.

The number of cases in the Infectious Hospitals of the London County Council on June 30th–July 1st was as follows: Small-pox, 124 under treatment, 1 under observation (last week 138 and 2 respectively); scarlet fever, 1112; diphtheria, 1421; enteric fever, 13; measles, 137; whooping-cough, 436; puerperal fever 36 (plus 8 babies); encephalitis lethargica, 206; poliomyelitis, 2; "other diseases," 152. At St. Margaret's Hospital there were 11 babies (plus 6 mothers) with ophthalmia neonatorum.

Deaths.—In the aggregate of great towns, including London, there was no death from small-pox, 1 (1) from enteric fever, 27 (0) from measles, 3 (1) from scarlet fever, 21 (7) from whooping-cough, 18 (2) from diphtheria, 39 (13) from diarrhœa and enteritis under two years, and 24 (3) from influenza. The figures in parentheses are those for London itself.

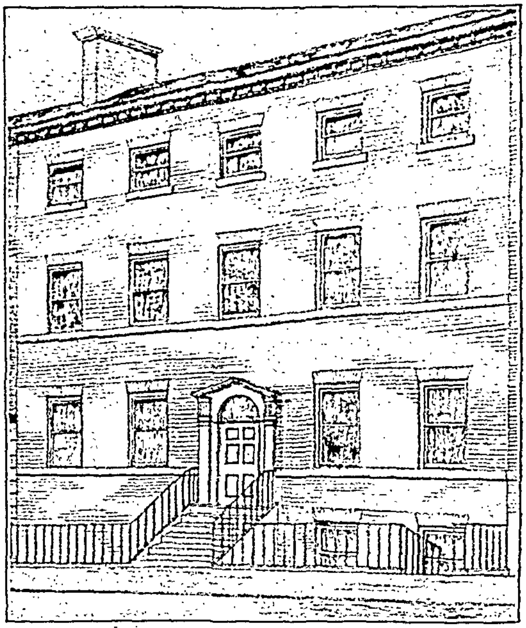
Small-pox was mentioned as the cause of death for the month of May in a case assigned to Coalville U.D., Leicestershire. Three deaths from meningococcal meningitis were reported in London, 2 from 15–25 years, 1 from 25–35. Eight deaths from measles occurred in Sunderland, 4 in South Shields, 3 in Birmingham. Birmingham reported 3 deaths from whooping-cough.

The number of stillbirths notified during the week was 275 (corresponding to a rate of 40 per 1000 births), including 37 in London.

CENTENARY OF THE LEEDS SCHOOL OF MEDICINE.

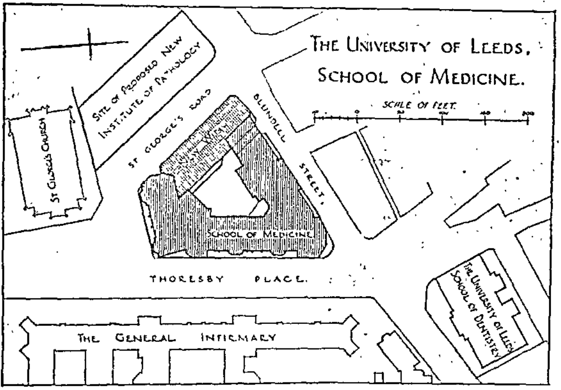
THE centenary of the Leeds School of Medicine was impressively and pleasantly celebrated on July 1st. The growth of what is now the Medical Faculty of the University of Leeds from the Medical School founded in 1831 makes a stimulating story. The school was united with the Yorkshire College in 1884. By this act of union the Yorkshire College was enabled to apply for admission to the Federal Victoria University and became one of its constituent colleges in 1888. In 1904 the University of Leeds became an independent University on the disruption of the Victoria University. From its earliest beginnings, when it found accommodation in a few back rooms in North-street, the progress of the medical school has been steady and encouraging. From 1834 to 1864 the work was carried on in a house in East Parade (Fig. 1) which is now converted into offices. In 1864 Sir James Paget opened the buildings in Park-street, where several men who are still in active work took part in the teaching. These buildings were planned by Mr. George Corson, under the guidance, so far as their requirements were concerned, of the members of the teaching staff. In those days, however, little more was deemed necessary than a dissecting room, a lecture theatre, and very limited laboratory accommodation. In 1894 a long cherished wish was realised, and the present building in Thoresby-place was opened by the King and Queen, at that time the Duke and Duchess of York. Excellent accommodation was secured for the anatomical department; what was deemed adequate for physiology and pathology was provided, and the facilities for the teaching of the other subjects were greatly increased. The buildings were erected according to plans drawn up by Mr. W. H. Thorpe. With this

FIG. 1.



The home of the School of Medicine from 1834 to 1864.

FIG. 3.



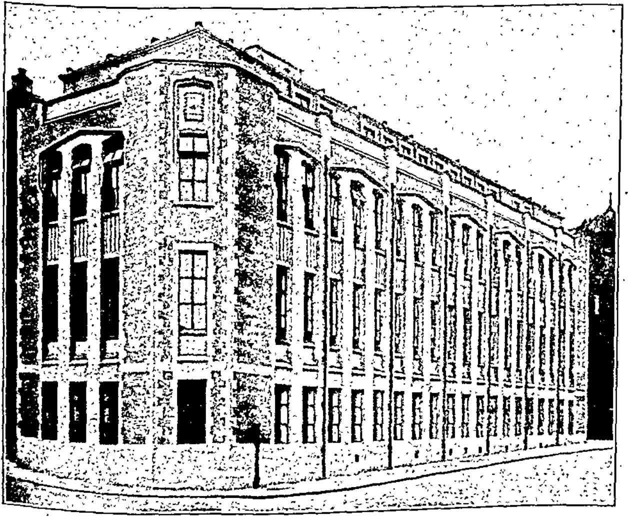
The plan of the medical buildings, giving the position of the new wing shown in Fig. 2 and of the site of the proposed new Institute of Pathology.

great advance in the school there must always be associated the honoured name of Thomas Scattergood, who was for many years Dean of the school and of the medical department of the Yorkshire College. He it was who determined in his mind the site, who impressed the authorities with its manifest advantages, who succeeded in inducing the college to acquire the land, and who, ably seconded by Prof. Birch and in a lesser degree by others, watched every step in the preparation of the plans and in the actual carrying out of the work. Scattergood, by his great personality, developed in others something of his own enthusiasm. The building occupied three sides of a quadrangle, and though little has required to be altered in the structure, extensions to improve the accommodation for physiology and pathology have been found necessary. The first requirement has been met by the completion of the fourth side of the quadrangle, and this part of the building has been planned by Mr. J. C. Procter, advised by Prof. McSwiney (Fig. 2). The large new block which is being put up in the immediate vicinity of the main building will give ample accommodation for an Institute of Pathology. It is impossible to think of the Leeds School of Medicine apart from the School of Dentistry, or from the General Infirmary, and other charitable institutions of the city. The position of the school buildings in relation to some of the associated institutions is shown in Fig. 3.

The main event in the celebrations was the congregation of the university over which the Chancellor, the Duke of Devonshire, presided. About 50 delegates from the other universities of the country and of other teaching bodies and institutions, were first received by the Chancellor, and addresses of welcome were then given by him and by the Vice-Chancellor, Sir James Baillie. Replies were made by Sir Humphry Rolleston and by Major-General Hime, R.A.M.C., a former pupil of the school. Honorary degrees were then conferred upon Dr. Hawkyard, who occupies the position of Lord Mayor, on Dr. Jane Walker, Dr. A. G. Barrs, Sir John Bland-Sutton, Lord Dawson of Penn, Sir Walter Morley Fletcher, Sir Gowland Hopkins, and Sir George Newman.

On the evening before the formal ceremony a dinner was given by the past students of the school, at which most of the delegates were present. The chairman was Lord Moynihan, who proposed the toast of the guests in felicitous terms; Prof. Arthur Hall, of Sheffield, replied. Most of those present went on to a reception which was given by the Lord

FIG. 2.



The new wing, opened in 1930, of the present School which dates from 1831.

Mayor at the Art Gallery. On the same day as the congregation was held, the Leeds and West Riding Medico-Chirurgical Society, of which this year the Lord Mayor happens to be the president, gave a luncheon to the delegates. Speeches were made by the President, by the Duke of Devonshire, by Prof. Dobson, and by Sir George Newman. On the same afternoon receptions were held at the School of Medicine and at the General Infirmary, and a long, interesting, if somewhat full, day was brought to a close by the university dinner, presided over by Colonel Tetley, the pro-Chancellor, followed by a ball.

The celebrations have done much to emphasise the unity of the university, of which indeed the school is the oldest part. Its old names need not even now be laid aside, and as the Medical School of the University of Leeds its continued development and prosperity is assured.

IRELAND.

(FROM OUR OWN CORRESPONDENT.)

VISIT OF DR. ARIËNS KAPPERS.

Dr. C. U. Ariëns Kappers, Director of the Central Institute of Brain Research at Amsterdam, visited Dublin last week to receive the Degree of Doctor in Science *honoris causa* from the University of Dublin. During his visit he gave three lectures, which were open to all medical men and students of medicine or science. On July 2nd he lectured to the Royal Academy of Medicine in Ireland on the Structure of the Brain in Prehistoric and Historic Races. On the 4th he lectured to a meeting of the British Neurological Surgeons on the Phylogeny of the Glial and Meningeal Tissues and the Cerebro-Spinal Fluid Cavities, and to the Royal Medico-Psychological Association on the Function of the Layers of the Cerebral Cortex. Despite the abstruse nature of his topics, Dr. Kappers's gifts as a lecturer and his admirable command of the English tongue rendered his discourses intensely interesting to his audiences.

HONORARY DEGREES AT DUBLIN UNIVERSITY.

In addition to that conferred on Dr. Kappers, two other honorary degrees of interest to the medical profession were conferred last week at the Summer Commencements of Dublin University. The degree of Doctor in Medicine was conferred on Sir John Rose Bradford, F.R.S., late President of the Royal College of Physicians of London. In presenting Sir John, the Public Orator, Sir Robert Tate, Fellow of Trinity College, Dublin, drew attention to his pioneer work on the physiology of renal secretion, and his applications of his findings to clinical medicine. A similar degree was conferred on Major-General Sir Foster Reuss Newland, who was himself educated at Dublin University. The Public Orator drew attention to Sir Foster's distinguished services in the Great War.

DISCUSSION OF A DUBLIN HOSPITAL IN THE SENATE.

Last week Senator Sir John Keane moved in the Senate of the Irish Free State that the Dublin Skin and Cancer Hospital should be included in the Sweepstake Scheme. The proposal led to a warm debate, in which the proposal was opposed by two medical men who are senators, Mr. O. St. Gogarty and Sir Edward Coey Bigger. The Minister for Justice gave his opinion, as reported in the daily press, that he was satisfied that the Cancer Hospital was not a voluntary institution. The accounts showed that the patients paid considerably more than the whole expenditure of the hospital. He was convinced that the Hospitals' Committee was right in refusing the application to include that hospital in the sweep. Sir John Keane withdrew his proposal.

THE SERVICES

ROYAL NAVAL MEDICAL SERVICE.

Surg. Vice Admiral Sir Arthur Gaskell, K.H.S., has been placed on the Retd. List.

Surg. Rear Admiral R. St. G. S. Bond to be Surg. Vice Admiral.

Surg. Capt. H. R. H. Denny to be Surg. Rear Admiral.

Surg. Comdrs. Cyril V. Griffiths and Frank L. Smith to be Surg. Capts.

Surg. Lt. J. G. Maguire to be Surg. Lt.-Comdr.

ROYAL NAVAL VOLUNTEER RESERVE.

Surg. Lt.-Comdr. R. Hall to be Surg. Comdr.

ROYAL ARMY MEDICAL CORPS.

Lt.-Col. C. H. Turner, having attained the age for compulsory retirement, is placed on retd. pay.

Lt.-Col. C. R. M. Morris retires on retd. pay on account of ill-health.

Majs. T. J. Mitchell and R. C. Priest to be Bt. Lt.-Cols.

Maj. (temp. Lt.-Col.) W. B. Purdon to be Lt.-Col.

Maj. F. Casement to be temp. Lt.-Col.

Lt. T. E. Moles to be Capt.

Lt. J. C. Gilroy to be Capt., and remains secd.

D. K. Weston is granted a temp. commn. in the rank of Lt.

TERRITORIAL ARMY.

Lts. R. S. Taylor and C. M. Willcox to be Capts.

J. G. McCrie (late Cadet Serjt., G. Watson's Coll. Contgt., Jun. Div., O.T.C.) to be Lt.

R. H. Ballard to be Lt.

TERRITORIAL ARMY RESERVE OF OFFICERS.

Capt. T. H. Sansome, from Active List, to be Capt.

INDIAN MEDICAL SERVICE.

Lt.-Col. H. H. Thorburn to be Bt. Col.

Capt. J. R. Katariya to be Maj.

Lt. J. P. J. Little to be Capt.

Lt. (T.C.) N. L. Sah to be Capt. (T.C.).

ROYAL AIR FORCE.

Air Comdr. J. McIntyre to be Air Vice-Marshall.

Squad. Leader J. Rothwell and E. W. Craig to be Wing Comdrs.

COLONIAL MEDICAL SERVICE.

Dr. D. O. Peters has been appointed Medical Officer, Nigeria; Dr. E. J. Blackaby, District Medical Officer, Cyprus, has been promoted Medical Officer in the East African Medical Service, Nyassaland, and Dr. F. Keyt, Provincial Surgeon, Western Province of Ceylon, has been promoted to Medical Superintendent there; while Miss M. M. McDowall, Lady Medical Officer, Sierra Leone, has been made Lady Medical Officer, Gold Coast. Dr. L. A. Prins, Assistant Director of Medical Services in Ceylon, has been promoted to Deputy Director of Medical and Sanitary Services.

COMMISSIONS IN ROYAL ARMY MEDICAL CORPS.

Twenty-five permanent commissions in the Royal Army Medical Corps are offered to registered medical practitioners, under 28 years of age. There will be no entrance examination, but candidates will be required to present themselves in London for interview and medical examination. At the same time, a certain number of temporary commissions under similar conditions as regards age and qualifications will also be offered. Applications should reach the War Office not later than July 20th. All information as to conditions of service and emoluments may be obtained from the Under-Secretary of State, The War Office (A.M.D.1), Whitehall, London, S.W.1.

BRISTOL GENERAL HOSPITAL: ANNUAL REPORT.—In 1930 the new in-patients numbered 4387, a fractional reduction upon the preceding year; the out-patients were 30,751, also a small diminution. The average stay was 19·33 days, and the total cost per head £8 13*s.* 4*d.* The net deficiency on the year was £9629, and the bank overdraft was £21,159. The committee express their "profound concern" at the large number of patients awaiting admission.

CORRESPONDENCE

SUCCESSFUL MEDICAL SOCIETIES.

"A."—FOUR DISTINCT GROUPS.

To the Editor of THE LANCET.

SIR,—At no time in the history of medical science in this country have medical societies been more successful or more prosperous than at present. The reason is not far to seek if one considers what are the prime motives of these societies. They can be divided into four big groups.

(1) The *Specialist Society.*—In this category come the sections of the Royal Society of Medicine, the Association of Physicians, the Biochemical Society, and kindred organisations. Their object is to discuss theories and present new facts to those who are most able to criticise. The very spirit of criticism and scientific enterprise which is the essential atmosphere of such a body is necessary for keeping alive the fire of enthusiasm which all research workers need. These bodies often publish proceedings which form a useful platform from which to address a wider specialist audience, and act as a record of work done in special branches. Such groups must avoid the tendency to become too narrow or to be monopolised by a few individuals. When very specialised they act as an international medium, and their smaller use in a little sphere is compensated by their wider use in a larger one.

(2) The *General Medical Society.*—Here, particularly in the smaller towns, the membership consists largely of general practitioners, with two or three men representing respectively the various specialties. Here, too, a lecturer may be asked to read a paper on a given subject which is afterwards discussed by the general body. Clearly in this group the objects aimed at will be different from the first. The knowledge propounded will usually be far more proved, for the audience will be less able to criticise the more debatable aspects. If a paper is read by a specialist there will be a general unwillingness to cross swords with him. The society serves rather as a forum before which the general practitioner can receive a résumé of recent work, and as a stimulus to his own reading. This group brings men and women together socially, gives opportunities for good fellowship, and provides an efficient medium for concerted action in measures affecting the local corps medical. It also can act as a disciplinary body.

(3) The *Mixed Society* consists of doctors and laymen who have some common point of interest. An excellent example is the Medico-Legal Society, of which the members are either medical men, barristers, solicitors, chemists or others interested in forensic medicine. The chairman is alternately a doctor and a lawyer. Discussions here are very different from those heard at pure medical meetings. The criticising ear of another profession, and the need for an exact explanation of technical terms, induces a real clearness in the speaker's mind, while the medical focus is widened. Valuable friendships are formed in such a society, and it is not too much to say that the public health and criminal laws are greatly influenced by discussions at bodies of this kind where law-makers and experts meet in a spirit of camaraderie. Such a body has important repercussions in bringing out the medical snags of existing legislation, such as that on poisonous drugs, the punishment of juvenile delinquents, or the place of psychology in the criminal code.

(4) The *Hospital Society.*—In a fourth group are societies that have gathered round a hospital or centre—e.g., the West London Medico-Chirurgical Society, which was an offshoot of the West London Hospital, the Chelsea Clinical Society, and others. Attendance at meetings of these societies is small for many reasons. The practitioner finds the time of meeting clashes with his evening surgery, and naturally does not always wish to go to a medical meeting on his free evening. The consultant has his own society in town. Various expedients have been tried, of which the two most successful are dinner meetings and cinema films. A dinner meeting, if there is a good opener, will often attract 40 or 50 members. In organising a discussion good stage-management is needed. On a subject such as cholecystitis a physician may open who will be followed by a surgeon and pathologist, so that a complete picture of the disease is placed before the audience in its newest relationships.

As Dr. Raymond Crawfurd says, one of the important functions of a medical society is to provide a medium for the conveyance of fresh knowledge from the centre to the periphery. Apart from actual meetings, societies can do this in two ways: first, by a library service; and secondly, by publishing transactions. A magnificently organised library such as that of the Royal Society of Medicine does invaluable service. The ordinary worker has not the time to look up the many references needed for writing a scientific article, nor is he able to buy the books or periodicals required to keep abreast of modern knowledge in a specialty. This service can only be done by a well-supported medical society.

In clinical medicine the medical society is a stage for securing advice in a difficult case or enlarging clinical experience by seeing cases well worked out by others. The duty of presenting a case imposes on the practitioner a stimulating piece of work. Osler often used to tell his students that there was nothing that clarified one's knowledge so much as the writing of a short article. The general practitioner has a rich harvest of clinical material, and medical societies offer a ready medium for the projection of this knowledge. One of the most promising roads of advance in medicine lies along the way of clinical work carefully observed, annotated, and accurately presented. In furthering this work medical societies can do yeoman service.

I am, Sir, yours faithfully,

June 20th, 1931. A RESEARCH FELLOW.

"B."—THE PART PLAYED BY TRADITION.

To the Editor of THE LANCET.

SIR,—The ideal medical society is a subject which appeals very much to me; I am quite sure that tradition plays an enormous part, while Dr. Crawfurd is right when he says it must be run by men who are still young. The best medical societies I know are those of Guy's and Edinburgh. The London Hospital Medical Society, though younger, follows pretty closely in order of excellence. Now the reason for this excellence, I am certain, is the traditional interest taken by students in the society, at meetings of which there is much more active discussion from students, house officers, registrars, and members of the staff than is usually heard. The meetings which are successful at the Royal Society of Medicine are those where the work of some great contributor to medical knowledge is discussed, preferably by himself.

For example, the world-wide interest in B C G will attract people, and rightly so, to hear Calmette. So that the first essential in the ideal medical society is never to let Tom, Dick, or Harry invite himself to give a paper, but to choose somebody who is actively engaged on a subject which is bound to interest a large audience.

Societies, however, are apt to make the mistake of inviting a foreigner to give an address without having made sure as to the quality of his English. This can sometimes be remedied by the right sort of interpreter. At the thirteenth International Physiological Congress, which can be taken as a medical society for the purposes of this discussion, Pavlov addressed a packed meeting in Russian. At the opposite end of the platform was his distinguished pupil Anrep, who took up sentence by sentence and translated it. Nevertheless, the interest was in what Pavlov himself said. In our ideal medical society we would choose the enthusiastic English student of the great foreign master to interpret for him in this way. After all, the people came to hear Pavlov, and were delighted to *see* him speak, since hearing conveyed nothing.

Another point of the greatest importance is to explain to a man, even though he be a lecturer in a medical school, that his words will go for nothing unless he speaks up. It amazes me how many men cannot make themselves heard in the back row. My short experience tells me that every lecturer should expend time and trouble in making sure that his illustrations are bold and visible, so to speak, beyond the back row. A man will have the impudence to place on the epidiascope screen a closely typed foolscap page; the result is that he himself on the platform is the only man who can read it. What should be done is that his information should be condensed and every letter marked out boldly with India ink upon engineers' linen. It should be arranged in a square to fit in to a lantern slide. All charts, tables, and historical discussions should be put out in the same way.

In regard to clinical evenings, the greatest source of ill-success is to have too many cases. What one requires is to have a small number of cases so well selected that the discussion can hold an audience whose interests are wide apart. Furthermore, after the patient is wheeled out the demonstrator should address the audience in a bold voice, using illustrations and photographs prepared in accordance with the foregoing rules.

I am, Sir, yours faithfully,

June 22nd, 1931. MEDICAL CONSULTANT.

"C."—COLLECTIVE EXPRESSION OF LOCAL PRACTITIONERS.

To the Editor of THE LANCET.

SIR,—Local medical societies, that is to say, societies whose primary function is the consolidation of local unity and fellowship, are not so common as they might be. The completion, therefore, of the first year of its existence by the Paddington Medical Society is deserving of mention. Its achievements may prove a useful example to those seeking the formation of similar societies elsewhere.

In addition to clinical objects this society defines amongst its aims the promotion of the efficiency and independence of practitioners, and its record during the past year goes some way to justify the pretension. Its syllabus has included an extensive range of material in the fields of public health, medical jurisprudence, hospital and consultant liaison, the administration and extension of public services and their encroachments on private practice, the present and future administration of the National Insurance Acts, and the function of medical journalism. This may seem a somewhat wide horizon for a local society. But the aim, apparently successful, has been to effect a combination of subject and speaker so as to ensure useful as well as interesting references to the problems of actual practice.

Two features of this society's work deserve special mention. These are the production of a report on national health insurance practice, and a scheme for the reduction of infant mortality in Paddington. The report is the work of members who are themselves insurance practitioners, and it reviews, critically and constructively, the principles and the administration of the Acts since their inception.[1] The inauguration of a scheme for general practitioner treatment of infants in Paddington whose parents are unable to afford the paid services of a doctor has been brought about by voluntary liaison between medical and other officers of public services, private practitioners, and interested lay sympathisers in Paddington. Its importance lies partly in the absence of official municipal or State control, and of any element of compulsion. Its financial administration has been linked up with that of the London Public Medical Service, and its operation is open to any practitioner in Paddington.

The Paddington society deserves congratulation on the completion of work which has been not only attractive and interesting to its own members, but, though modestly conceived in the first place for the purposes of local discussion, has attracted attention outside the borough.

I am, Sir, yours faithfully,

June 20th, 1931. A GENERAL PRACTITIONER.

TREATMENT OF CEREBRO-SPINAL FEVER.

To the Editor of THE LANCET.

SIR,—In your issue of June 20th (p. 1373) L. H. Copping asks for other observations on the treatment he describes. During the war I had charge of the military cerebro-spinal fever cases in the Isle of Wight, and generally injected the cerebrospinal fluid intramuscularly, in addition to intrathecal injections of antimeningococcal serum. It was, I think, a valuable aid to recovery. In several pleuritic effusions I had injected the fluid in the same way, and this gave me the idea.

I have also used a somewhat similar treatment in a severe case of pemphigus.

The patient, a boy 2 years old, had bullæ profusely scattered over the body and limbs and seemed very ill. The mother stated that at the age of 4 months he had had a very similar attack and nearly died, and that he had had some milder recurrences at intervals since. Fluid was drawn from the blebs, and about 2 c.cm. was injected intramuscularly. The condition rapidly cleared up and the boy was free from symptoms until two years later, when he had another attack and the treatment was repeated. This was done four times in all, at varying intervals of a year or two, the symptoms being rather less severe each time. He is now ten years old, and has been practically free for two years. There was no syphilitic history.

The mother is convinced of the value of the injections. The blebs dried up rapidly after injection and fresh crops ceased to appear.

I am, Sir, yours faithfully,

L. P. GIBSON, M.R.C.S., L.R.C.P.

Cowes, Isle of Wight, July 4th, 1931.

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[1] See THE LANCET, Jan. 17th, pp. 140, 166.

ACUTE RHEUMATISM FOLLOWING TONSILLITIS.

To the Editor of THE LANCET.

SIR,—There are several points in Dr. E. C. Warner's letter which require comment. When at the first annual meeting of the British Pædiatric Association, held at Windermere in May, 1928, I first discussed in a paper the "silent period" between nasopharyngeal infection and subsequent rheumatic relapses,[1] the theory received some criticism. Dr. Campbell and Dr. Warner's valuable studies published in your columns in 1930, and Dr. Sheldon's recent article, gave me, therefore, some satisfaction in confirming my original thesis. I cannot agree, however, with Dr. Warner that these acute relapses of rheumatism "can occur after any illness liable to produce a state of lowered resistance in the child." Surely there must be a more definite explanation than this, especially as a similar "silent period" is the rule when rheumatism follows the exanthemata that Dr. Warner has quoted. It is significant that, with the exception of chicken-pox, all the acute infectious fevers mentioned by him as giving rise to rheumatic complications are closely associated with streptococci in the throat. This, to my mind, is the important common factor between them and acute tonsillitis in the ætiology of subsequent rheumatism. Dr. Poynton and I tried to express this in our recent book on rheumatism when we said (p. 105) that "the first symptoms in a certain proportion (of rheumatic children) will be found to date back to a definite illness. Scarlet fever is the best known example, but the commencement of rheumatism has also been traced to other infections in which the streptococcus is much in evidence, such as measles, influenza and diphtheria . . ."

Dr. Warner appears to have misread Dr. Sheldon's argument about the non-infectiousness of rheumatism. I understood him to imply that rheumatism per se is not *infectious* to other patients, although the preceding throat infection might be. Much has been written about contagion in rheumatism, and Dr. Poynton and I took some pains in our book to refute this supposition. Nobody with any knowledge of rheumatism in children could dismiss peremptorily an *infective* element from the disease, although the exact bacterial pathogenesis is perhaps still not entirely clear. Here I am in agreement with Dr. Warner, but would hesitate to accept his simile between the valvular vegetations in rheumatism and subacute bacterial endocarditis as in any way proof of his contention. At this juncture, however, I do not wish to draw that red herring into your columns.—I am, Sir, yours faithfully,

BERNARD SCHLESINGER.

Portland-place, W., July 4th, 1931.

To the Editor of THE LANCET.

SIR,—Dr. Warner regards one of my remarks as "an unwarranted conclusion." This is because he has misunderstood my use of the word *infectious*, and I should therefore be glad if you would allow me to correct the wrong impression which my sentence has created.

Various authors have pointed out that acute rheumatism may occur in epidemics. In my paper evidence was advanced to show that acute rheumatic relapses were often preceded at a definite interval by sore throats, and one of the points I wished to bring forward was that the spread of rheumatism from case to case was carried out through the medium of the preliminary sore throat. In order to illustrate this point I compared the rheumatic reaction with post-diphtheritic paralysis. Everyone knows that epidemics of diphtheritic sore throat may occur, but surely no one imagines that post-diphtheritic paralysis can be conveyed from case to case. Using *infectious* in the sense of *communicability of disease*, I wrote "the rheumatic reaction whether arthritic or cardiac, has no more claim to be considered infectious than has, for example, post-diphtheritic paralysis." I was not concerned with the question of whether the rheumatic reaction was *infective*, using infective in the sense of "invasion of the tissues by pathogenic organisms." To have said that the rheumatic reaction was not the outcome of an infection by organisms would indeed have been an unwarranted conclusion.

I am, Sir, yours faithfully,

London, W., July 7th, 1931. WILFRID SHELDON.

STATE CONTROL OF THERAPEUTIC SUBSTANCES.

To the Editor of THE LANCET.

SIR,—In your report (June 27th, p. 1401) of my remarks on Dr. Hartley's paper unfortunately one word has dropped out. The final sentence should read, "It was hoped to make a Schick toxin which would stand *hot-room* temperature for several days." The point is a not unimportant one. The original Schick toxin used some years ago with a phenol diluent was very unstable. By the use of boric-borate-buffer (Glenny and Pope) there has been available for several years, and in clinical use, toxin diluted with buffer solution which is stable for many weeks. Recently Bunney (U.S.A.) used 2 per cent. peptone solution as a diluent. We find some difficulties with this particular dilution, and A. T. Glenny has made a variant. He finds that 1–1000 peptone dilution with buffer solution provides Schick toxin which is stable in the hot room for at least a week, and at ordinary room temperature for months. This has been tried clinically and appears to be satisfactory.

I am, Sir, yours faithfully,

R. A. O'BRIEN.

The Wellcome Physiological Research Laboratories,
Beckenham, Kent, July 1st, 1931.

MORTALITY AFTER PROSTATE OPERATIONS.

To the Editor of THE LANCET.

SIR,—I was gratified to see that my small article in your issue of June 13th brought letters from both Mr. Everidge and Mr. Page. At the same time I feel one or two points require further attention.

In the first place, may I say that the object of the article was to bring to notice the importance of the matter, and it was only a preliminary report of research work which I have still under investigation. In the second place, I am well aware that the blood-urea is altered by many conditions other than the effect of ether. It is so affected by gas and oxygen anæsthesia. I simply tried to suggest that this was not to the same extent as when ether was employed, and I think that this is borne out by the Table I gave of a series of cases of general surgery. I could have provided evidence to show that with spinal anæsthesia there was not the same post-operative rise. As to the mortality-rate after prostate operations in "a hospital," the figure was taken from the only material I had available at the time, and was simply used as an illustration to substantiate my view as to this being too high. I have since learned that the average mortality-rate in that hospital over a number of years is considerably less.

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[1] Arch. Dis. Child., 1928, iii., 176.

Finally, I would like to add that the experience of Mr. Page—whose skill in spinal anæsthesia I witnessed 14 years ago—rather supports the view suggested in my article.—I am, Sir, yours faithfully,

Liverpool, July 6th, 1931. R. J. MINNITT.

AUDIOMETRY AND AUDIOGRAPHY.

To the Editor of THE LANCET.

SIR,—In the report of the discussion on audiometry and audiography in the Otological Section of the Royal Society of Medicine in your issue of July 4th, p. 20, I am credited with referring to a paper I read some years ago (at the International Otological Congress at Boston, U.S.A., in August, 1912) showing a method of audiometry by tuning-forks, correcting the time error by a logarithmic scale, and reducing it to true loss of hearing power. That, however, accounted only for duration, not for the dying away of the vibrations. This latter sentence should apply only to the method of audiometry devised by Hartmann, which recorded simply the percentage loss of duration of hearing for the tuning-forks. The application of the logarithmic scale *did* take into account the dying-away of the vibrations and reduced the percentage loss of duration of hearing to the percentage loss of hearing power.

The methods of testing and of logarithmic correction will be found in detail in the *Journal of Laryngology* (June, 1929). I have a few reprints at the disposal of any who are interested in the subject.

I am, Sir, yours faithfully,

London, July 7th, 1931. JAMES DUNDAS-GRANT.

TUBERCLE BACILLI IN CREAM.

To the Editor of THE LANCET.

SIR,—Much attention has been focused on the need of a pure-milk supply in England—particularly in relation to tuberculosis. Little mention has been made of the possibility of cream and butter containing tubercle bacilli. Can you enlighten me on the subject? In India, in military dairies, it is customary for milk to be pasteurised before being made into cream and butter, in order to prevent the possibility of the spread of typhoid by these foodstuffs.

I am, Sir, yours faithfully,

G. FAWSITT TAYLOR,
Captain, Indian Medical Service.

King's College Hospital, July 4th, 1931.

PUBLIC HEALTH SERVICES

REPORTS OF MEDICAL OFFICERS OF HEALTH.

THE following are 1930 statistics of five county boroughs:—

Name of district and estimated (R.-G.) mid-year population.	Birth-rate.	Death-rates per 1000 of the population.					Death-rates per 1000 births.		
		All causes.	Tuberculosis.	Cancer.	Respiratory diseases with influenza.	Heart disease.	Infant and neonatal mortality.	Young child (1–5 yr.) mortality.	Maternal mortality in childbirth.
Coventry (173,240)*	13·9	9·6	0·94	1·16	1·4	1·8	57/30	21	7·0
Reading (97,050)†	14·4	11·4	1·06	1·53	1·7	1·5	55/39	9	2·1
Bootle (84,970)*	21·1	11·1	1·27	1·00	1·9	1·4	79/26	36	3·3
West Bromwich (80,840)†	20·7	11·4	0·84	1·30	2·2	1·9	66/35	35	2·4
Eastbourne (59,000)‡	11·3	11·3	0·63	1·76	1·0	2·4	40/24	10	6·0

Registered stillbirths per 100 live births:—Coventry 4·9, Reading 3·3, Bootle 4·7, West Bromwich 4·0.

* Local estimate. † R.-G. estimate for 1929. ‡ R.-G. estimate for 1929 was 58,570.

Coventry.

Dr. A. Massey refers to 1930 as an historic year, as during it the Local Government Act, 1929, began to operate from April 1st and the Housing Act, 1930, was born, whilst the Mental Treatment Act was passed and came into operation on Jan. 1st, 1931. The chief change under the first Act was that the former poor-law hospital became the Gulson-road Municipal Hospital. It contains 301 beds and the new nurses' home begun by the guardians was officially opened on April 1st, 1931. At present it contains a more or less stationary population of 100 chronic cases, who are suited to a simple institution rather than to a well-equipped hospital, and the need for the early removal of these cases is evident. The housing position in Coventry is peculiarly difficult owing to the rapid increase in population pari passu with the virile growth of local industry. The five year programme includes a clearance of five small areas (150 houses with 750 inhabitants), the demolition of 75 unfit houses occupied by 375 persons, and the renovation of 600 unfit houses. It is also expected that during this period most of the 649 munition hutments owned by the council and 377 privately owned hostels of a similar type will be demolished. During the year the Coventry House Improvement Society has been formed and its first operation has been to acquire and recondition 14 houses at a cost of £900.

The Mental Treatment Act virtually establishes a preventive side to psychological medicine by providing for "voluntary" and "temporary" patients. A mental out-patient clinic is already in existence, conducted by the medical superintendent of Hatton Mental Hospital. In the matter of provision for mental deficiency accommodation has been found in outside institutions for high-grade defectives. The guardians had acquired the Exhall estate, which now comprises 144½ acres, and a scheme is on foot to make initial accommodation for 40 male low-grade defectives and to increase the accommodation gradually to 400 beds. During the year complete coördination was effected between voluntary and municipal child welfare centres. The public health committee now supplies the medical and nursing services at the voluntary centres. Plans have been prepared for a new isolation hospital of 152 beds with a view to extension ultimately to 236 beds. All the preliminary details of the public abattoir scheme have been completed and a loan sanctioned for £83,210. Building will begin during the current year.

In June a representative committee was appointed by the Warwickshire and Coventry tuberculosis committees to consider and report on the desirability of forming a joint tuberculosis colony similar to Papworth. The committee was still at work at the year end. Diphtheria was the only infectious disease which occasioned serious concern during the year.

There were 484 cases notified and 40 deaths—a case-fatality of 8·3 per cent. During the year 734 school-children were immunised.

Reading.

Dr. H. J. Milligan reports that the primary step under the Local Government Act was the constitution of the hospital portion of Battle Infirmary (formerly poor-law) as Battle Hospital and the delegation of its management to the health committee. Under a progressive board of guardians this hospital during the last ten years has been brought thoroughly up to date. The beds number 279, and the hospital is well-equipped for general medicine, surgery, midwifery, and diseases of women. Under the new Act the relieving officer no longer acts as a necessary medium between the sick person and a bed in the hospital, but the medical superintendent is in direct touch with outside practitioners for the admission of their patients. The mental deficiency committee has in hand a comprehensive scheme to provide for the accommodation of mental defectives.

An extensive site has been procured for the housing programme of the next five years. There are about 600 houses which fall below a reasonable standard of fitness and of these 238 have been scheduled for demolition. It is also proposed to deal with a series of clearance areas and to erect 2000 additional houses on the Whitley estate. By-laws are needed for houses let in lodgings, chiefly houses originally used by single families and now let to several tenants. As examples of the exorbitant rents obtained, Dr. Milligan mentions a large house holding 11 separate families who pay a total weekly rent of £7 8s. 6d.

A small explosive outbreak of glandular fever affecting nine persons occurred in one of the university hostels in May. The principal features were fever for from two to eight weeks, a rash similar to typhoid, and enlargement of the glands of the neck and scalp. All the patients recovered without ill-effect. One case of undulant fever occurred; the patient made a good recovery. Dr. Milligan mentions that the neonatal mortality-rate was much higher than the average of recent years, but he has no satisfactory explanation to suggest. During the year, 34 milk samples were examined for tubercle and four gave a positive result. During the past 11 years out of 282 milk samples examined 31, or more than 10 per cent., have contained tubercle bacilli. For the disposal of refuse "controlled tipping" has been adopted. The process has been closely followed during the year and no complaints of flies, rats, or offensive smells have been received.

Bootle.

As the institutions of the West Derby Union which deal with the sick and able-bodied poor are outside the borough, an agreement has been made with the Liverpool City Council that for a period of ten years Bootle shall be at liberty to send these patients to the Liverpool Public Assistance Committee's institutions. It is hoped to provide for the maternity cases at present confined in Liverpool Public Assistance institutions in an enlarged Bootle maternity home. Domiciliary (poor-law) medical attendance is now controlled by the Public Assistance Committee acting through Dr. F. T. H. Wood, the medical officer of health, and the two district medical officers are empowered to use the services of the nurses of the Bootle Association for patients treated at their own homes.

Since 1920, 1665 municipal houses have been built; the renovation of 1200 houses during the next five years is contemplated. A beginning has been made with the postnatal supervision of mothers; 747 new cases attended the antenatal clinics and 65 of these returned to the clinic for re-examination six weeks after confinement. A new health centre is to be built in the north of the town, and the isolation hospital is to be extended by the erection of a new 45-bed pavilion which will make possible the admission of cases of measles and whooping-cough now sent to Liverpool Public Assistance institutions.

West Bromwich.

The Hallam Hospital, which has been transferred from the guardians, is well situated in extensive grounds in a central but open part of the town. It is managed by the Health Committee, and has 474 beds and a visiting staff of eight physicians and surgeons. The senior visiting physician, Prof. Douglas Stanley, acts as medical superintendent, and Dr. W. Stott, the medical officer of health, as chief administrative officer. Prof. Stanley states that 4183 patients were admitted during the year; his report shows that the antenatal department has done excellent work; the hospital provides 26 maternity beds. Probationer nurses are sent to the fever wards in the isolation hospital for three months' duty. Dr. Stott points out that the accommodation at Hallam Hospital is 50 per cent. too great for the needs of West Bromwich and that it would be a serious matter if the outside authorities terminated their agreements with West Bromwich by which they share the use of this hospital. It would be a waste of the Hallam Hospital accommodation and of public money if other hospitals were built in the neighbourhood. An orthopædic centre is urgently needed, and it is hoped that this need will be met during the current year. A postnatal clinic under the visiting gynæcologist, Mr. J. S. M. Connell, is in existence at the Hallam Hospital at which it is proposed to give advice in selected cases on the question of birth control. Dr. Stott reports that breast-feeding is frequently discontinued without adequate reason, and it is estimated that only a little more than one-half of the babies are breast-fed. The records show that 46 babies were taken off the breast without medical advice before they were 14 days old, yet only five notices of "change to artificial feeding" were received from midwives.

Unfit houses in the borough are estimated to number 1300. During the last ten years 2278 municipal houses have been erected and there is a proposal to build a further 2000 during the next five years. It is difficult to find suitable sites within reasonable distance of the centre and of the works, owing to mining operations. In 1920, 35 areas, comprising 2871 houses, were represented as unhealthy, and since that date only one area has been cleared, although demolition is progressing in three others.

Eastbourne.

Dr. W. G. Willoughby reports that the altered arrangements under the Local Government Act were soon working smoothly. St. Mary's Hospital, transferred from the poor-law, is under the care of the Public Assistance Committee. One of the blocks, containing 22 beds, is used for infirm cases, and if these could be transferred to a simpler institution Dr. Willoughby considers the hospital accommodation in the borough would be adequate. At present there is a shortage of beds for children.

As regards the five years' housing programme, no area requires special consideration, but Dr. Willoughby thinks that 236 houses should be provided under the 1924 Act and 14 under the 1930 Act, and that 100 houses of the smaller type should be erected. He points out that there is a waste of municipal houses owing to change of the original needs of the tenants. It thus comes about that the committee goes on building while the older municipal houses are occupied by persons who have no special need of them.

More than a third of the births took place in the maternity home during 1930, and, including the extern cases, half the births in the borough were managed from the home. In all these cases antenatal work was carried out. Three local cases of undulant fever were reported in November and December, and a fourth had previously been removed to hospital from the rural district. The milk-supply was different for each patient and no goat infection or connexion between the four cases could be traced.

OBITUARY

EDWARD BEADON TURNER, F.R.C.S.

We announced last week the death of the well-known doctor and athlete, Mr. E. B. Turner, which occurred at his London residence on Tuesday, June 30th, in his 77th year. He had known during the last year the incurable nature of his infliction but bore the pain with uncomplaining courage, and his death may have come as a surprise to many friends.

MR. E. B. TURNER.

[Photograph by F. A. Swaine.

Born in 1854, Edward Beadon Turner was the elder son of the late Mr. George Turner, of Sherborne and Sussex Gardens, London. He went to Uppingham when, under Edward Thring's inspiration, the school was taking a high place among the English public schools. He has himself recorded in one of his many happy after dinner speeches, that he had a stormy career under that great teacher and disciplinarian, describing his progress to the upper sixth as having been "at the point of the cane"; but he left school with a sound classical training, besides winning many sporting trophies, and throughout his life made a hero of his old headmaster. In 1873 he proceeded for his medical education to St. George's Hospital, won a Brackenbury scholarship, took the English diplomas, and became house physician and assistant demonstrator of anatomy. In 1881 he obtained the F.R.C.S. and went into private practice in Sussex Gardens, where he resided until the end of his life and where he conducted a general practice with great ability, and also with extreme generosity towards his less affluent patients. The practice was always a good one, but, with Turner, ministry to the sick was ever in the front of his thoughts. In addition to private practice he was consulting physician to the Paddington Home of Rest and visiting apothecary at St. George's Hospital. But his record of public work was so full a one that his position as a doctor was somewhat obscured in the eyes of many who did not know that his forcible and clear-cut views on the promotion of the physical well-being of the nation and on the conduct and status of the medical profession were informed throughout by his personal experience as a successful practitioner.

It was not until the conflicts over national insurance arose that Turner manifested any overt interest in medical politics, but the early shape of the proposed legislation, with its unfortunate attitude towards medical practice, drew him into the conflict between the promoters of the Bill and the general practitioners of the country. He put his views and those of many others with conviction and fluency and was soon recognised as a courageous champion of medical rights. He devoted time and energy in demonstrating the injustices inherent in an immature piece of legislation, and when the struggle died down he remained convinced that the compromises, however largely they might have been in favour of the medical profession, were a mistake in result as well as in tactics. This work brought him into the prominent notice of the British Medical Association. He became a member of the council and for three years, 1915–18, was chairman of the Representative Body. In 1920 he was elected one of the Direct Representatives of the profession on the General Medical Council, a seat which he held for five years. At the Council meetings he exercised an influential voice, and on his retirement the President, in his annual delivery, said that Turner's presence would be missed as one "whose vigorous fluency of address and intimate acquaintance with divers sides of medical life and practice had often given colour to grey debates."

During the war Edward Turner did much valuable work. A chief medical officer of the special constabulary, he was selected for a special honour for bravery during an air raid, while he was untiring in his labours for promoting physical well-being among the soldiers. Day after day he gave counsel to our young army on the maintenance of health and on the avoidance of the risks of venereal disease to which they were subjected. His eloquent, sometimes homely, and always forcible deliveries were a source of strength and comfort to large numbers of lads during that long period of trial, and Turner's diary during those dark days would have constituted a claim for public recognition far higher than that which could be put forward for many who received high honours. In his public discourses on venereal disease he had the advantage of particular familiarity with the facts of its incidence, for from the first he had been prominent in the deliberations of the National Council for the Combating of Venereal Disease. And when the programme of that body became steadily enlarged, as the British Social Hygiene Council, with the necessary reconciliation of conflicting views among the leaders, Turner became chairman of the executive and propaganda committees, and a vice-president, being until the day of his death a moving spirit in its activities. He was a medallist of the Order of the British Empire, and a member of the Advisory Committee on Social Hygiene of the Colonial Office, and he wrote in various quarters in support of sanitary progress. But though he spoke regularly at meetings of medical societies he was an infrequent writer. In these columns and in the *British Medical Journal* he recorded his experiences of influenza epidemics in general practice, and he wrote in the Badminton library on cycling from the medical standpoint.

Turner was an enthusiastic sportsman. He came to St. George's Hospital as a winner of school athletic prizes and a keen footballer, and while at the hospital was a member of the Rugby football team which secured for three or four years in succession the inter-hospital cup for a small medical school. In 1875, while still a student, he was selected to play for England, and for the next three years he played for his country, once at least in an England team which included his younger brother, Sir George Turner. On the racing track he won many prizes, among others the inter-hospital mile, and was elected on the committee of the London Athletic Club of which he eventually became president. He was an enthusiastic devotee of the tricycle, and when his football days were over, and the exigencies of private practice filled his working day, he took up tricycling as a means of exercise, with the result that he broke the world's record, amateur and professional, for distances from 2 to 25 miles and eventually held all the records on the racing track, and (with S. Lee) the 50 mile tandem record on the road. Despite the fact that he had lost the sight of one eye, through diphtheritic infection incurred when he was a house physician, he became a first-class game shot, and at 40 years of age he took up yachting, owned, sailed, and raced a small yacht, and with characteristic enthusiasm worked for and obtained an extra-master's certificate in navigation, a possession which he shared with only two other amateurs.

Mr. Turner married Margaret Isobel, daughter of the late Henry Scott of Bombay and Hyde Park-street, London, who survives him and by whom he had four daughters.

WILLIAM ELDER, M.D., F.R.C.P., F.R.S.Edin.

Dr. William Elder, who died in Edinburgh on July 3rd, at the age of 66, came of a family of farmers well known in East Lothian. He graduated at the University of Edinburgh in 1885 and took the M.D. in 1896. After a resident post in the Infirmary and some experience of practice, he was appointed as assistant physician to Leith Hospital and a year later as full physician, retiring in 1909. He established a large general practice and soon became recognised as a thorough and reliable clinician; though technically a general practitioner, he developed the status of a consultant. From the beginning, he was especially interested in the central nervous system. His M.D. thesis, which gained a gold medal, was on Aphasia and the Cerebral Speech Mechanism, and later he published a book on "The Physical Basis of Memory" and contributed several articles to the *Encyclopædia Medica.* He wrote a number of papers on cerebral cases, on pernicious anæmia and other conditions emerging in his clinical work, but his primary interest was psychology, both normal and morbid. His last book, "Studies in Psychology," was a careful study of memory, emotion, consciousness, sleep, dreams, and allied mental phenomena. The book indicates wide reading, checked and criticised by clinical experience, and is full of interesting argument. His practical criticism of psychotherapeutic methods was the work of a reflective physician, who brought a wide general culture to the assistance of his profession.

Dr. Elder is survived by his wife, Dr. Eleanor Russell. A younger brother, George Elder, a man of equally great promise, died many years ago.

MEDICAL NEWS

Royal College of Surgeons of England.

On July 2nd three Fellows were elected into the Council to fill the vacancies caused by the retirement in rotation of Mr. J. Herbert Fisher, Mr. G. E. Gask, and Mr. Graham Simpson. The result of the poll was as follows:—

ELECTED—	Votes.	Plumpers.
Graham Scales Simpson	659	73
George Ernest Gask	635	12
Albert James Walton	544	35

In all 1105 Fellows voted, including 193 Fellows resident out of Great Britain and Ireland; in addition one vote was found to be invalid and six were received too late. Mr. Simpson and Mr. Gask are re-elected and Mr. Walton is elected for the full period of eight years.

University of Liverpool.

At recent examinations the following candidates were successful:—

M.D.

S. Alstead, R. E. Horsfall, E. D. Irvine, J. Libman, and C. L. G. Pratt.

M.B. AND CH.B. WITH HONOURS.

Class I.—T. L. Hughes.
Class II.—W. J. Chisnall and A. L. Potter.

FINAL EXAMINATION FOR M.B. AND CH.B.

Part III. (1923 Regulations).—M. L. Kaufman.

Part B. (1921 Regs.).—H. T. Cank, L. M. Crooks, W. S. Diggle, H. G. Evans, I. Harris, J. H. Hughes, O. V. Jones, W. W. Laughland, T. E. Lennon, H. F. Loewenthal, A. J. Martinez, P. B. Moroney, J. Sytner, J. V. Tollington, Winifred Walls, A. R. Williams, D. I. A. Williams, and A. Wynroe.

D.P.H.

Part I.—Enid M. Hughes, D. H. Williams, and Mary G. T. Williams.

Part II.—A. C. Briffa.

D.T.M.

J. A. K. FitzGerald.

D.T.H.

F. E. Camps, E. R. Gauld, K. T. Moir, M. Salah el Din, and G. Verghese.

University of Durham.

At recent examinations the following candidates were successful:—

THIRD EXAMINATION FOR M.B. AND B.S.

Pathology, Pharmacology, Public Health, &c.—H. W. Beetham, Chandar Bhan Bhugra, A. G. Bowerbank, D. G. French, Dorothy D. Nichol, S. M. Parker, John Short, and R. T. Wordingham.

University of Birmingham.

On July 4th the following degrees and diplomas were conferred:—

M.D.—*A. C. R. Walton, G. H. Knight, and H. J. Williams.

* With honours

Ch.M.—James Gore.

M.B., Ch.B.—† H. N. Gregg, †A. G. W. Whitfield, and F. H. C. Beards, J. A. R. P. Cant, W. S. Coltart, H. L. N. Davies, R. J. de Carteret, T. A. S. Kennerley, Nancy Laughton, H. J. Riley, Eric Rudkin, M. H. Sherwell, and R. B. F. Usher-Somers.

L.D.S.—J. L. T. Davies, and S. J. Foster.

† With second-class Honours.

Victoria University of Manchester.

At recent examinations the following candidates were successful:—

CH.M.

A. A. Davies.

FINAL EXAMINATION FOR M.B. AND CH.B.

* T. S. Heslop.

* First-class Honours.

† Nancy N. Carter, † J. C. Smith, † G. G. E. Smyth, Frank Cort, H. B. Craigie, P. M. Crowe, Frank Livesey, Edith A. Longson, J. P. Longworth, Simon Mills, Gerald Ramage, John Scully, Barnet Stone, Isaac Sutton, Kenneth Todd, and C. H. T. Wade.

† Second-class Honours.

FINAL EXAMINATION FOR L.D.S.

Marion Bentz, Henry Dellow, G. W. Hargreaves, J. W. Lord, and Maurice Sheldon.

Fellowship of Medicine and Post-Graduate Medical Association.

A course in general medicine and surgery will be held at the Miller General Hospital from July 20th to 31st, daily, from 10.30 A.M. to 5.30 P.M. Though not restricted to practitioners, this course is primarily intended for them. A course in urology will be given at the All Saints' Hospital, Vauxhall Bridge-road, from August 4th to 29th. From the 17th to the 29th a course in Diseases of Children will be given at the Queen's Hospital for Children, Hackney-road. Courses in September will include: Diseases of the Chest, at the Brompton Hospital; Psychological Medicine, at the Bethlem Royal Hospital; Diseases of Infants, at the Infants' Hospital; ophthalmology, at the Central London Ophthalmic Hospital; and general medicine and surgery, at the Westminster Hospital, followed by a similar course at the Metropolitan Hospital. All syllabuses may be obtained from the Fellowship at 1, Wimpole-street, London, W.1.

COLLEGE Dr. Robert Fielg Library

Mental Hospitals Association.

The thirteenth annual meeting of this association will be held at the Guildhall, London, on Wednesday next, July 15th, at 11 A.M.

St. Thomas's Hospital Dinner.

The old students' dinner will be held on Friday, Oct. 2nd, at the Mayfair Hotel, Berkeley-street, London, with Mr. J. Herbert Fisher in the chair. A portrait of Sir Cuthbert Wallace, painted by Mr. George Harcourt, R.A., will be presented by the chairman.

A Hospital Garden Party.

On Wednesday last week the Prince of Wales lent the grounds of Marlborough House for a children's garden party in aid of the restoration fund of the Children's Hospital, Great Ormond-street. The occasion took the form of a fair with a large variety of amusements, and some of the numbered programmes carried prizes which were distributed by Sir James Barrie.

Course on Surgical Tuberculosis.

Under the direction of Dr. Etienne Sorrel, a course of 12 lectures on surgical tuberculosis and other affections of the locomotor system will be given at the Hôpital Maritime at Berck-Plage, Pas-de-Calais, France, from August 3rd to 14th. Particulars are obtainable from Dr. Delahaye at the hospital.

Hygiene and Nursing in the Tropics.

The British Red Cross Society will hold a course of nine lectures and demonstrations on Tropical Hygiene and Nursing, beginning on Monday, Sept. 28th, at 5.30 P.M. This course is intended for people going to warm climates for the first time. Particulars may be obtained from the county secretary, 9, Chesham-street, London, S.W.1.

Medical Uses of Seaside Resorts.

Dr. Carl Häberlin, of the Marine Hospital at Wyk, on the island of Föhr, near Heligoland, is opening a discussion at the Section of Hydrology and Climatology of the British Medical Association on the Treatment of Delicate Children at the Seaside. The Section is holding a reception for him at the Saffrons Rooms, Eastbourne, on Wednesday, July 22nd, at 5.30 P.M., and invites the attendance of members of the medical profession who are interested in the organisation and development of marine health resorts.

Rockefeller Medical Fellowships.

The Medical Research Council announce that, on behalf of the Rockefeller Foundation, they have awarded travelling Fellowships for 1931–32 to: Ernest Thomas Conybeare, M.B., of Guy's Hospital; Gordon Moncrieff Dean, M.B., of the Department of Surgery, Aberdeen University; Morris Harris Finkelstein, M.B., of the Department of Bacteriology, Edinburgh University; Owen Stanley Gibbs, M.B., late Professor of Pharmacology in Dalhousie University, Canada; Emanuel Mannie Lourie, M.B., of the Liverpool School of Tropical Medicine; Allan William Spence, M.R.C.P., of St. Bartholomew's Hospital; Conrad Hal Waddington, M.A., of the Strangeways Research Laboratory, Cambridge; and Kenneth Harold Watkins, F.R.C.S., of the Royal Infirmary, Manchester.

The Fellowships awarded to Dr. Gibbs and Mr. Waddington are tenable in Europe, the others at centres in the United States. Dr. Conybeare and Mr. Waddington have been appointed on modified conditions while receiving emoluments from other sources.

Royal Society of Tropical Medicine and Hygiene.

The Chalmers medal, founded in memory of the late Dr. Albert Chalmers, has been awarded to Dr. N. Hamilton Fairley for distinguished original work in tropical medicine, particularly on the serology of helminthic infections.

Benefaction for Research on Puerperal Fever.

At a dinner held on July 6th, at the Savoy Hotel, in aid of Queen Charlotte's Maternity Hospital rebuilding fund, Sir Thomas Horder stated that the Rockefeller Foundation had entrusted the Medical Research Council with funds to the value of £21,000, spread over seven years, to be used for the further assistance of research work into puerperal fever and other causes of maternal mortality, in which the Council were coöperating with the hospital.

Brighton and Hove Provident Dental Hospital.

This institution, which has for so many years carried on its work in Queen's-road, Brighton, is about to be transferred to new premises in Buckingham-road. To adapt the large private house into a hospital, and equip it suitably, will entail a large expense, and at the annual meeting of the governors on June 4th it was intimated that the hospital would be making its first big public appeal. In 1930, no fewer than 5589 patients were treated at the hospital, which was 615 more than in 1929. The great increase is attributed to the working of the Sussex provident scheme.

Hospital Libraries.

The trustees of the British Red Cross Society and Order of St. John Hospital Library will be at home on Wednesday, July 15th, at 5.45 for 6 P.M., in the new nurses' home of the Middlesex Hospital, London, W. The speaker will be Dr. Barrie Lambert, chairman of the central public health committee of the London County Council.—At a summer school to be held by the Library Association at Birmingham there will be a session for hospital librarians on August 22nd, at 11.30 A.M. Speakers will include Dr. Nairn Dobbie. Also, at the Library Association's annual conference at Cheltenham a session will be devoted to hospital libraries (August 31st, 5.30 P.M.) and Sir Bruce Bruce-Porter will give an address.

Post-graduate Training for Ship Surgeons.

On the recommendation of a committee consisting of representatives of the shipping companies, the Ministry of Health, the London School of Hygiene and Tropical Medicine, the Seamen's Hospital Society, and the British Medical Association, a programme for post-graduate courses for ship surgeons has been formulated, and some of the lectures and demonstrations began at the Devonport pathological laboratory of the Seamen's Hospital Society at Greenwich on Monday last, July 6th. The principal objects are to enable ship surgeons to take "refresher" courses, and for candidates for such posts to receive special instruction in many subjects—e.g., ship's hygiene, Board of Trade requirements, and clinical work, in their special application to conditions on board ship. Instruction on tropical medicine and hygiene will be given at the London School of Tropical Medicine and the Hospital for Tropical Diseases. Ship surgeons will be able to obtain a diploma for special efficiency in subjects germane to their calling, and although it is not proposed that this should be an essential qualification for appointments, the shipping companies have lent their support to the arrangements. Particulars are obtainable from the Seamen's Hospital Society, Greenwich.

PARLIAMENTARY INTELLIGENCE

NOTES ON CURRENT TOPICS.

STERILISATION OF DEFECTIVES.

A BILL legalising the voluntary sterilisation of mental defectives will shortly be introduced in the House of Commons by Major A. G. Church. The object of the Bill is to make the sterilisation of mental defectives a lawful act upon their own application or that of their parents or guardians, the expression "guardian" including "any person who undertakes or performs towards a defective the duty of a parent or guardian or has charge of him." The voluntary nature of the Bill is well guarded. First, if the subject be capable of expressing willingness consent must be obtained; secondly, in the case of the married defective the other partner must agree; thirdly, the consent of the Board of Control must be obtained, and the operation must be approved by judicial authority—e.g., a bench of magistrates. The operative interference is defined in the Bill as follows:—

(1) The expression "sterilising operation" shall mean vasectomy, salpingectomy, and any other surgical operation whereby the patient is rendered incapable of procreation or child-bearing without the capacity to exercise the sexual functions being otherwise impaired.

(2) Any medical treatment which attains the same result as a sterilising operation with the same limitation in its effect as regards the sexual functions shall be treated as a sterilising operation for all the purposes of this Act.

CREWS' ACCOMMODATION ON BRITISH SHIPS.

Mr. GRAHAM, President of the Board of Trade, in reply to Sir Basil Peto, said that since the regulations as to crews' accommodation were last revised in 1923, the standard of accommodation has been rising, especially in new ships, in many of which the accommodation provided is above the minimum laid down in the regulations. Complaints, however, have been received that the accommodation on British ships is unsatisfactory, and compares unfavourably with that on certain foreign, especially Scandinavian, ships. These complaints are always investigated individually, but to obtain a true picture of the conditions throughout the British Mercantile, the Board of Trade arranged for a comprehensive survey by their surveyors, who were instructed when visiting ships in the normal course of their duties to investigate and furnish particulars of the condition of the crew spaces on all ships, both British and foreign, visited by them during the period December, 1927, to March, 1928. In addition, the Shipping Federation appointed in May, 1929, a special committee to advise owners as to arrangements for the comfort and convenience of crews. This committee has made two reports relating to the accommodation of seamen other than lascars, one dealing with new cargo ships of 1500 tons gross and upwards, and the other with new cargo ships below that tonnage. A number of valuable recommendations are made, many of which go beyond the existing Board of Trade regulations. Model plans are appended to the reports showing arrangements for the crew, which would give a floor area and cubic capacity considerably in excess of the present statutory minimum, and indicating that, in the great majority of new ships, including even those of relatively small tonnage, it should be possible to provide a separate messroom for the crew. A special arrangement of the sleeping berths avoids double tiers of bunks, and useful suggestions are made in connexion with washing and sanitary facilities. Central heating by hot water is recommended for ordinary cargo ships, other than tankers; the importance of adequate ventilation and heating is recognised. The provision of an isolation hospital on all large foreign-going cargo vessels is also recommended. The committee lays special stress on the proper supervision and cleansing of the crews' quarters, and suggests the imposition of penalties for failure. These recommendations, as originally made, applied particularly to new ships of 1500 tons gross and over, but the shipping federation have agreed with the Board of Trade that they should be adopted wherever practicable irrespective of the size of the ship. The reports have been examined in the Department and also by the Joint Advisory Committee of the Board of Trade and the Ministry of Health on the health of the Mercantile Marine, and the opinion, both of the Board and of the joint committee, is that if the recommendations are followed, a material improvement in the standard of accommodation will result. The recommendations have also been considered by the Merchant Shipping Advisory Committee who have expressed the opinion that the recommendations should be of great value in securing improvements in the accommodation provided in new ships. The Board of Trade have given their general approval and will take action to give effect to the recommendations. They are circulating to their surveyors particulars of the recommendations, instructing them to ascertain, in the case of all new ships, the proposals as regards crew spaces as early as possible, so that, if necessary, they can approach the owners and builders and discuss with them the possibility of making appropriate improvements. The reports do not deal in any great detail with existing ships, as there must, of necessity, be great difficulty in securing improvements involving structural alterations. But in lavatory and washing accommodation the Board agrees that much can be done, as well as by the substitution of metal bunks for wooden berths, and the proper lighting, ventilation, painting, and cleaning of the crews' quarters. The surveyors are being instructed to secure improvements of this nature in cases where the age and condition of the ships and the particular trades in which they are engaged warrant the improvements.

MINING INDUSTRY WELFARE.

On July 7th, in reply to a question by Mr. LAWTHER, who asked the Secretary for Mines if he could state the names of the members of the committee to investigate the work of the Mining Industry Welfare Act, Mr. SHINWELL (Secretary to the Mines Department) said that the committee had now been constituted as follows:—Viscount Chelmsford (chairman), Lord Erskine, M.P.; Mr. G. Macdonald, M.P.; Mr. G. Mander, M.P.; Mr. A. K. McCosh (nominated by the Mining Association of Great Britain); and Mr. Alfred Smith (nominated by the Miners Federation of Great Britain). The terms of reference would be: to inquire how far the objects of Section 20 of the Mining Industry Act, 1920, have been met, what remains to be done, and whether the scope of the fund and the existing machinery for its administration as defined in that Section and as developed in practice are satisfactory for the future; and to report on all these matters with particular reference to the question of the amount and duration of the levy in the future.

Rural Housing.

In the House of Commons on Tuesday, July 7th, the Financial Resolution authorising the Minister of Health and the Scottish Department of Health to assist rural district councils in England and county councils in Scotland to provide houses in rural areas was agreed to in committee.

In the House of Lords on July 7th, the Merchant Shipping (Safety and Load Line Convention) Bill was read the third time and passed. The Bethlem Hospital (Amendment) Bill passed the report stage. The Marriage (Prohibited Degrees of Relationship) Bill was read a second time.

HOUSE OF COMMONS.

WEDNESDAY, JULY 1ST.

Motor Accidents and Danger Signs.

Mr. HURD asked the Minister of Transport if his attention had been called to the increase of motor accidents, often fatal, through collisions at cross-roads; and whether he would approve of a standard form of danger sign to be erected at these points.—Mr. MORRISON replied: I am not aware of any evidence that motor accidents at cross-roads are increasing. There is already a standard international sign giving warning of the approach to cross-roads which has been erected in large numbers throughout the country. I propose shortly to review the whole question of road traffic signs in connexion with the provisions of Section 48 of the Road Traffic Act, 1930.

Foreign Strawberry Pulp and Preservatives.

Sir THOMAS INSKIP asked the Minister of Health (1) whether the use of chemicals such as sulphur dioxide or lime as preservatives would be allowed in the case of foreign strawberry pulp about to be imported during the next four weeks; and what steps he proposed to take to prevent the risk of injury to health by the use of such preservatives; and (2) whether he was aware that the importation of foreign strawberry pulp, dressed with sulphur dioxide or other chemicals as preservatives, was about to take place; and whether he was prepared to take such steps as might be open to him to prevent such importation and, if so, what steps.—Miss LAWRENCE replied: Under the Preservatives Regulations the only chemical preservatives allowed in strawberry pulp are sulphur dioxide and sulphites. My right hon. friend understands that the use of these preservatives is regarded as a commercial necessity for both home-produced and foreign fruit, and in view of the small residual amount allowed in the jam made from the pulp he does not think that he would be justified in amending the regulations so as to prohibit their use.

THURSDAY, JULY 2ND.

Pharmacy and Poisons Bill.

Mr. BROMLEY asked the Home Secretary whether he had considered the representations made to him by the pharmaceutical organisations on the subject of the Pharmacy and Poisons Bill; and whether he proposed to take any steps to meet the objections raised by these organisations.—Mr. CLYNES replied: As there has been a good deal of misunderstanding about the scope and objects of the Poisons and Pharmacy Bill, I crave indulgence for a somewhat lengthy statement. This Bill is based upon the recommendations of a Departmental Committee which was appointed by the previous Administration, and reported in 1930. The committee which, apart from its pharmaceutical members, was entirely independent of any of the commercial interests affected, found that the existing position relating to poisons was far from satisfactory, and the object of the present Bill is to provide for a wider and much more effective regulation of poisons than exists at present. I understand that the pharmaceutical associations take exception to the Bill on two main grounds. In the first place they demand that all doctors' prescriptions, whether they contain poisons or not, shall be dispensed by registered pharmacists only. This proposal does not, however, come within the scope of the Bill. Moreover, it has never been investigated, and even if it were assumed that there was a prima facie case for considering that the demand is in the public interest, the Government could not ask Parliament to adopt such a proposal except after adequate inquiry and after the interests of those who would be affected by the prohibition had had opportunity of stating their case. Secondly, the pharmacists demand that the increased facilities which the Bill proposes for the supply to farmers of agricultural poisons shall be limited to firms carrying on a bona fide business in the supply of agricultural requisites. I am advised by the Minister of Agriculture and by the Board of Agriculture for Scotland that this limitation would not make adequate provision for legitimate needs in the more rural districts. The Government, however, have decided to propose an amendment to the Bill which will have the effect of requiring the Poisons Board and the Secretary of State, in considering the allocation of poisons as between Part I. and Part II., to have regard to the desirability of restricting the contents of Part II. (which will contain the list of poisons which may be sold by persons other than pharmaceutical chemists) so far as is consistent with the provision of adequate facilities for the public to obtain supplies of non-medical substances which are in common use.

Schools for Mentally Defective Children.

Mrs. MANNING asked the President of the Board of Education the number of special schools for mentally defective children which had been opened during the years 1926, 1927, 1928, 1929 and 1930 respectively.—Mr. LEES-SMITH replied: The numbers of special schools for mentally defective children open during the years in question were five in 1926, four in 1927, none in 1928, four in 1929, and one in 1930.

Insured Persons and Sickness Benefit.

The Marquess of TITCHFIELD asked the Minister of Health whether he had read the report by Sir Walter Kinnear, the Controller of the National Health Insurance Department, which stated that a recent investigation showed that 12 persons out of 100 were drawing sickness benefit when they were capable of returning to work; and whether he proposed to take any steps to rectify this state of affairs.—Mr. GREENWOOD replied: I am aware of the statement referred to, which was to the effect that out of a large and representative group of insured persons who were in receipt of sickness or disablement benefit on a certain day, and whose title to benefit was made the subject of special investigation, it was found that 12 per cent. were capable of work and consequently not entitled to benefit. I have already addressed circulars to all approved societies and to all insurance medical practitioners on the steps to be taken to avoid payment of benefit to persons not entitled thereto, and I would also refer the noble Lord to the reply which I gave to the right hon. Member for West Woolwich on June 18th.

Slum Clearance and Plague of Vermin.

Sir MARTIN CONWAY asked the Minister of Health whether he was aware that, owing to the recent destruction of some slum houses in Westminster which belonged to the London County Council, a plague of vermin, notably of the species *Acanthia lectularia*, had invaded certain streets within the borough; and whether he would take steps to see that the municipal authorities disinfected the houses attacked by this pest, seeing that the insects in question were well-known carriers of infection of certain diseases.—Mr. GREENWOOD replied: I was not previously aware of the facts stated in the first part of the question. I have no power to give directions to the local authorities in this matter, but I will communicate with them and inform the hon. Member of the result.

Sir M. CONWAY: Is the right hon. gentleman aware that the female of this enterprising insect lays eggs four times a year, 50 at a time, so that the eradication of a pest of that sort exceeds the powers of the dwellers in most private houses; and will he call the attention of the Westminster municipal authorities to the fact that the Chelsea municipal authorities undertake the extirpation of this enterprising insect, and ask them if they will follow the example of Chelsea?

Mr. GREENWOOD: I will certainly do my best to bring this interesting information to their notice.

Protection Against Poison Gas.

Brigadier-General CLIFTON BROWN asked the Prime Minister whether, in view of the scheme detailing measures which should be taken for the protection of civilians from poison gas which was recommended by an international committee of experts in 1928, any steps had been taken on the matter in this country; and what steps had been taken by foreign nations.—Mr. MACDONALD replied: The report to which the hon. and gallant Member refers has been brought before the Standing Subcommittee of the Committee of Imperial Defence concerned with these matters. Various foreign nations are known to be actively studying this question, but I am unable to say what steps they are taking. As I have said in answer to previous questions on this subject, the ratification of the Geneva Gas Protocol of 1925 by most of the countries in Europe provides an important safeguard against this form of attack.

Registration of Illegitimate Children.

Mr. DAY asked the Minister of Health whether, in view of the present regulations existing for the registration of illegitimate children, he would consider the introduction of legislation which would have as its object the registration of the birth of these children in such a way that they did not bear the stigma of illegitimacy.—Mr. GREENWOOD replied: I would remind the hon. Member that the primary object of birth registration is the establishment of a record for the purpose of furnishing legal evidence in regard to matters of civil status, and that so long as a distinction is drawn by the law for many important purposes between legitimate and illegitimate children, the obliteration of this distinction in the birth register would merely destroy its utility to a very large extent, without affording any compensating advantages to the individuals affected.

MONDAY, JULY 6TH.

Nursery Schools.

Dr. HASTINGS asked the President of the Board of Education the number of nursery schools completed, being built and sanctioned in connexion with provided and unprovided schools to date, and how many of these schools in each class were of the open-air type.—Mr. MORGAN-JONES (Parliamentary Secretary to the Board of Education) replied: There are 44 nursery schools recognised by the Board of Education, 23 being provided schools, and 21 voluntary schools. There are 11 provided, and three voluntary schools in course of erection. In addition, preliminary proposals have been sanctioned for 12 provided schools. Practically all the schools now being built are open-air schools; of the existing schools the majority are planned on open-air lines, and the remainder have good open-air facilities.

Post-graduate Medical School.

Dr. HASTINGS asked the Minister of Health what progress was being made in the arrangements for post-graduate teaching in the Hammersmith Hospital.—Miss SUSAN LAWRENCE (Parliamentary Secretary to the Ministry of Health) replied: A Royal Charter constituting the Governing Body of the British Post-graduate Medical School and defining the functions of the Governors was approved by the King in Council on June 29th; and active steps are being taken, in collaboration with the London County Council to proceed as quickly as possible with the planning and building of the school, and with the adaptation of the hospital for the purposes of post-graduate medical education.

Dr. HASTINGS asked if Miss Lawrence had any idea when the school would be opened for teaching purposes.

Miss LAWRENCE said that she could not say at the present moment.

A RAILWAY BED.—A bed in the Norfolk and Norwich Hospital has recently been endowed by the London and North-Eastern Railway staff hospital fund of the Norwich district. It has been named "The Drury Bed," in recognition of the services to the institution of Mr. H. W. C. Drury, who until recently was superintendent of the Norwich district of the railway.

Appointments

HOLDERNESS, R. C., M.B., B.S. Lond., D.P.H., has been appointed Asst. Medical Officer of Health, Bury.

City of London Maternity Hospital, City-road, E.C.: WALLACE W. H. S., M.B., B.S.Lond., Resident Medical Officer, and BARBER, A., L.R.C.P. Lond., M.R.C.S., Assist. Resident Medical Officer.

Certifying Surgeons under the Factory and Workshop Acts: HILL, R. M., M.B., Ch.B. Glasg. (Tooting); CRAIG, J. (Grosmont, York).

Vacancies

☞ *For further information refer to the advertisement columns.*

Aberdeen, City of.—M.O. in charge of the Council's Mental Health Services. £950.

Accrington, Victoria Hospital.—H.S. £150.

All Saints' Hospital for Genito-Urinary Diseases, 91, Finchley-road, N.W.—H.S. At rate of £150.

Barnsley, Beckett Hospital and Dispensary.—Cas. O. and H.P. £250 and £200 respectively.

Beckenham, Kent, Bethlem Hospital, Monks Orchard, Eden Park. Res. H.P. At rate of £150.

Birmingham Ear and Throat Hospital, Edmond-street.—H.S. At rate of £200.

Birmingham General Hospital.—Two Res. Anæsthetists. Each £120. Also Res. H.P. and three Res. H.S.'s. Each £70.

Birmingham, Midland Hospital, Easy-row.—H.S. £150.

Birmingham P.H. Dept., Tuberculosis Section.—Asst. M.O. £400.

Birmingham, Queen's Hospital.—H.S. for Ear, Nose, and Throat. Also H.P. for Birmingham and Midland Nerve Hospital. Each at rate of £70. Also Dental H.S. At rate of £50–£70.

Birmingham, Selly Oak Hospital.—Casualty O. At rate of £200.

Blackburn County Borough.—Asst. M.O.H. and Asst. School M.O. £500.

Bolton Infirmary and Dispensary.—Two H.S.'s. Each £150.

Bradford Children's Hospital.—H.P. £120.

Bradford Royal Infirmary.—Three H.S.'s. Each £150.

Brighton, New Sussex Hospital, for Women and Children.—Hon. Asst. Ophth. S. Also H.P. and H.S. Each £100.

Brighton, Royal Sussex County Hospital.—Two Hon. Med. Registrars. Also three Hon. Surg. Registrars.

Bristol Eye Hospital.—Asst. Res. H.S. £100.

Bristol Royal Infirmary.—Sen. Res. M.O. £200. Also Res. Dental H.S. and Res. Cas. H.S. Each £80. Also Res. H.P.'s and H.S.'s. All at rate of £60. Also Hon. Asst. to Obstetric Dept.

Bury Infirmary, Lancs.—Third H.S. At rate of £150.

Chester, East Lancashire Tuberculosis Colony, Barrowmore Hall, Great Barrow.—Asst. M.O. At rate of £275.

Dreadnought Hospital, Greenwich.—Physician, for Dept. of Physical Medicine. 50 guineas.

Dudley, Guest Hospital.—Two H.S.'s Each £160–£170.

Durham County Hospital.—Two H.S.'s. Each £150.

Durham University College of Medicine.—Jun. Demonstrator in Physiology. £250–£300.

East London Hospital for Children, &c., Shadwell, E.—H.S. and Cas. O. £125.

Evelina Hospital for Children, Southwark, S.E.—H.S. At rate of £120.

Exeter, Royal Devon and Exeter Hospital.—H.P. Also H.S. to Spec. Depts. Each at rate of £150.

Folkestone, Royal Victoria Hospital.—Sen. and Jun. Res. M.O.'s. At rate of £125 and £100 respectively.

Great Yarmouth General Hospital.—H.S. £140.

Hampstead General and North-West London Hospital, Haverstock-hill, N.W.—Cas. Surg. O. for Out-patient Dept. At rate of £100. Also H.P. At rate of £100.

Hove, Lady Chichester Hospital.—Jun. H.P. At rate of £50.

Huddersfield Royal Infirmary.—H.S. At rate of £150.

Hull Royal Infirmary.—3rd H.S. At rate of £150.

Inverness, Royal Northern Infirmary.—Two H.S.'s. Each at rate of £100.

Ipswich, East Suffolk and Ipswich Hospital.—Cas. O. £120.

King Edward Memorial Hospital, Ealing, W.—Sen. and Jun. Res. M.O.'s. £250 and £150 respectively.

King's Lynn, West Norfolk and King's Lynn General Hospital.—H.P. At rate of £150.

Kingston-upon-Hull, City and County of.—M.O.H. £1500. Also Sen. Asst. M.O.H. for Maternity and Child Welfare Dept. £800.

Lancaster Royal Infirmary.—Jun. H.S. £130.

Leamington Spa, Warneford, General Hospital.—Hon. Surgeon for Diseases of Ear, Nose, and Throat.

Leeds Hospital for Women.—H.S. £100.

Leeds, Tuberculosis Sanatorium, Killingbeck.—Sen. Asst. Res. M.O. £350.

Leicester Royal Infirmary.—Sen. M.O. for Veneral Diseases Dept. £500.

Liverpool Royal, Babies' Hospital, Woolton, and Crofton Recovery Hospital for Women, Aigburth.—M.O. At rate of £200.

Liverpool Royal, Children's Hospital.—Res. M.O. and second Res. M.O. for Heswall Branch. At rate of £180 and £120 respectively. Also two Res. H.P.'s and two Res. H.S.'s for City Branch, Myrtle-street. All at rate of £100.

London Hospital, E.—Hon. Asst. Anæsthetist.

London Light and Electrical Clinic, Ranelagh-road, S.W.—Med. Reg. £300.

Manchester, City Education Committee.—Asst. School M.O. £600.

Manchester Royal Eye Hospital.—Jun. H.S. £120.

Manchester, St. Mary's Hospitals.—Five H.S.'s. All at rate of £50.

Manchester Victoria Memorial Jewish Hospital, Cheetham.—Jun. H.S. At rate of £125.

Manor House Hospital, Golders Green, N.W.—Jun. M.O. £200

Maudsley Hospital, Denmark Hill, S.E.—Asst. M.O. £475.

Middlesex County Council.—Ophthalmic Surgeon. £2 12*s.* 6*d.* per session.

Nottingham General Hospital.—Cas. O. At rate of £200.

Plymouth, South Devon and East Cornwall Hospital.—H.S. At rate of £100.

Queen Mary's Hospital for the East End, E.—H.P.

Queen's Hospital for Children, Hackney-road, E.—Res. M.O. At rate of £200.

Reading, Royal Berkshire Hospital.—Res. Anæsthetist. At rate of £150.

Rotherham Hospital.—Cas. H.S. £150. Also H.P. £180.

Royal Northern Hospital, Holloway, N.—Asst. Pathologist. £500.

St. John's Hospital, Lewisham, S.E.—H.S. and Cas. O. Each at rate of £100.

St. Leonard's-on-Sea, Buchanan Hospital.—Jun. H.S. £125.

St. Mark's Hospital for Cancer, Fistula, &c., City-road, E.C.—H.S. At rate of £75.

St. Thomas's Hospital Medical School, S.E.—Sen. Demonstrator in Anatomy. £500.

Scunthorpe and District War Memorial Hospital.—Res. Surgeon. Also second H.S. £250 and £150 respectively.

Sheffield Children's Hospital.—3rd Res. M.O. At rate of £80.

Sheffield, Jessop Hospital for Women.—Asst. H.S. At rate of £100.

Sheffield Royal Hospital.—Cas. O. and Ophth. H.S. £150 and £120 respectively. Also Res. Anæsthetist. At rate of £80.

Sheffield Royal Infirmary.—H.S., Ophth. H.S., Asst. Aural and Ophth. H.S. Each at rate of £80.

Society of Apothecaries of London, Water-lane, Queen Victoria-street, E.C.—Examinership.

Southampton, Free Eye Hospital.—H.S.

South London Hospital for Women, South Side, Clapham Common, S.W.—Two H.S.'s. Each at rate of £100.

South Shields, Ingham Infirmary.—H.S. £150.

Stafford, County Bacteriological Laboratory.—Bacteriologist. 12 guineas per week.

Stockport Infirmary.—H.S. £175.

Sutton, Sutton and Cheam Hospital.—Res. M.O. At rate of £100.

Swansea General and Eye Hospital.—H.P. £150. Also Asst. Pathologist. £500.

Talgarth, Breconshire, South Wales Sanatorium.—Jun. Asst. Res. M.O. £250.

Victoria Hospital for Children, Tite-street, Chelsea, S.W.—H.P. and H.S. Each at rate of £100.

Warrington Infirmary and Dispensary.—Jun. H.S. £175.

Warwick County Mental Hospital, Hatton.—Second Asst. M.O. £450.

Willesden General Hospital, N.W.—H.P. and H.S. At rate of £100 and £110 respectively. Also Registrars.

The Chief Inspector of Factories announces vacancies for Certifying Factory Surgeons at Moreton-in-Marsh (Gloucestershire); at Carmarthen (Carmarthenshire); at Bedford (Beds.); at Lutterworth (Leicestershire); and at Holywell (Flints).

Births, Marriages, and Deaths

BIRTHS.

HUNT.—On July 1st, at Welbeck-street, W., the wife of Dr. W. S. Hunt, of a son.

SADLIER.—On July 1st, at "Brown Heath," Buxted, Sussex, the wife of Dr. H. W. Sadlier, of a son.

MARRIAGES.

FAINGES—SMYTH.—On July 4th, 1931, at St. Peter's, Battersea, by the Rev. G. Bell, assisted by Rev. J. M. Cobbett, Donald Sutherland, youngest son of James Fainges, Esq., of Brisbane, Australia, to Doreen Croly, only daughter of Dr. James and Mrs. Smyth, of 382, Upper Richmond-road, Putney, S.W.

GILLESPIE—WALLACE.—On June 30th, at St. George's West Church, Edinburgh, Alexander MacAndrew Gillespie, M.B., D.T.M., M.R.C.P. (Edin.), F.R.G.S., West African Medical Staff, to Mary Agnes, youngest daughter of the late William Wallace and of Mrs. Wallace, Cairnie-street, Arbroath, Angus.

MOYNIHAN—FERGUSON.—On July 4th, at St. Mark's Surbiton, John Holmes Moynihan, M.R.C.S., L.R.C.P., to Sheila Janet Ferguson, M.R.C.S., L.R.C.P., only daughter of Mr. and Mrs. Ferguson, Ardmay Surbiton.

SAVIN—GRIFFITH.—On Saturday, July 4th, 1931, at Wimbledon, Lewis Herbert Savin, M.D., M.R.C.P., F.R.C.S., son of the late Lewis Savin, M.R.C.S., to Mary Helen Griffith, elder daughter of the late Mr. and Mrs. Walter Griffith.

SHAW—GRICE.—On June 30th, at St. Peter's, Caversham, Wilfred Shaw, M.D., F.R.C.S., to Frances Anne, third daughter of Mr. and Mrs. A. G. Grice, of Caversham.

DEATHS.

ANDERSON.—On July 2nd, 1931, at a Manchester Nursing Home, George Reinhardt Anderson, J.P., M.B.E., F.R.C.S., of 45, Westbourne-road, Southport, the beloved husband of Annie Eleanor Anderson. Service at Mornington-road Wesleyan Church, Southport, on Monday last. Funeral at Birkdale Cemetery.

JONES.—On June 29th, at Elm Tree House, High Halden, Kent, Dr. Isaac Stephenson Jones, aged 82.

TURNER.—On June 30th, at Westbourne-terrace, W., Edward Beadon Turner, F.R.C.S., aged 76.

N.B.—A fee of 7s. 6d. is charged for the insertion of Notices of Births, Marriages and Deaths.

NOTES, COMMENTS, AND ABSTRACTS

THE WORK OF AN INDUSTRIAL CLINIC.

By N. Howard Mummery, M.R.C.S. Eng.[1]

[Colonel Mummery began his lecture with a pertinent résumé of the progress made in this country during the nineteenth and especially the twentieth century in the promotion of industrial health, as instanced by the abolition of child labour and the developments in welfare organisation which have marked the world since the close of the war. He continued :—]

The British Position.

"In this country much has been done, but it appears that out of 142,000 factories and 133,000 workshops, large and small, only 2200 of the larger concerns—88 per cent. of which are factories—have so far adopted welfare schemes and employ nurses. Details obtained from 1006 of these concerns show that between them they employ 2022 nurses, of whom 1833 are female and 180 male; 91 per cent. of the female nurses are registered, but only 25 per cent. of the male. The average number of employees per nurse is 963. Of the 1006 industrial concerns providing details, 91 per cent. employ doctors on a full or part-time basis. It is known, however, that the number of medical men and women devoting themselves to this most important branch of professional work is steadily increasing in spite of industrial depression, and the available applicants for such posts greatly exceed the demand."

Commenting on this increase of popularity, Colonel Mummery called attention to Sir George Newman's estimate "that about 50 per cent. of the insured population of England and Wales go on the sick-list every year, and, as the average annual absence from work is computed by him to be 3·73 weeks, we are faced with the appalling fact that seven million persons lose between them 25 million working weeks annually. And although the standard of life has risen and mortality has fallen, sickness claims have risen since the recent war by 41 per cent. for men, 60 per cent. for unmarried women, and 106 per cent. for married women, while, says Sir Thomas Oliver (*Journal of State Medicine,* August, 1930), within the last 30 years the length of sickness has increased from 16½ days to 28 days."

Various factors responsible for the alleged increase in disability, or morbidity, rates, and probably all are contributing to it, were mentioned by the lecturer, who also referred to the difficulties of the panel practitioner in the matter of signing medical certificates to the satisfaction of patients, societies, and medical referees. He continued :—

State Assistance.

"To a large extent the old incentive of 'work or starve' has given way in many cases to an over-liberal State assistance; and we see the public in increasing numbers overwhelming the voluntary hospitals where the staffs are inadequate to supervise economically the period that elapses between restoration of function after injury—or recovery from illness—and the subsequent return to useful paid employment. To these factors tending to increase morbidity statistics one must, strangely enough, add welfare work itself, for recent reports of the Division of Research, Office of Industrial Hygiene, and the United States Public Health Service, show, in that country, that the welfare provision of granting wages during sick absence from work definitely prolongs such absence. Two large industrial concerns in the same metropolitan area and under similar general conditions were compared, and it was found that if wages were entirely lost while the worker was absent on account of illness, the record of absence was much lower for illnesses of short duration than when full wages were paid during such absence. This was attributed, not to malingering, but to the fact that employees tended to stay at home and take more care of their ailments, such as colds, which they could not afford to do if wages were lost at such times. But the conclusion was reached that however advantageous it might appear to employers to pay only for time worked, or for sick benefit societies to withhold sick benefit during the first week's disability, the fact remains that the spreading of disease, which entails such heavy industrial losses, is facilitated by the worker continuing at work, or returning to it, while ill. Lack of provision for sick leave and sick pay falls heavily not only on the employee, but indirectly upon the employer too, and militates against improvement in the public health. The reports referred to—which may be studied with benefit in the *Journal of Industrial Hygiene* for November and December, 1930—confirm others published in this country that the incidence of industrial sick absence is most prevalent among the younger workers and affects the females more than the males; that the duration of sick absence increases with the age of the workers, largely owing to the more serious diseases tending to occur at the later ages when recuperative ability is waning—though it is interesting to note that a group of employees over 70 years of age compared very favourably, as regards annual disability absence, with the younger age-groups.

"In this country we recognise that the State has made provision for the industrial population during physical incapacity by means of National Health Insurance and Workmen's Compensation and Employers' Liability Acts. Some short-sighted employers seem to think that by paying their statutory contributions under the first-named Act, and insuring themselves against the risks of the latter Acts, they are doing all that can reasonably be expected of them and all that good business management calls for. They are unable to see the importance of the personal factor in industry which demands careful study if the best service is to be obtained, and forget that skilled workers cannot be trained in a day, and that nothing is more wasteful than excessive labour turnover and an unduly large absentee list. These State enactments, good as they are, fail to meet fully the needs of the industrial population or those of industry itself. They need supplementary and alternative services which the employer alone is able economically to provide. Industrial welfare provides such additional services as an integral part of good management. It is purely a voluntary service initiated, financed, and controlled by the employer, and not, as a rule, contributed to by the workpeople, nor assisted by the State—though with official recognition of its value certain Home Office regulations and inspections have followed, requiring certain minimum standards in various trades. Welfare services are not, and never should be, mere philanthropic side-shows. They are part of competent industrial management, and a factor in production. They should stand the acid test of their value to the community as a whole, and of their value in assisting the conduct of the industrial or commercial concern to earn good profits and pay good wages. If a welfare scheme fails in either of these directions it becomes a costly form of philanthropy, but it will not fail if conceived and conducted on right lines, and the employer who cares adequately for the well-being and well-doing of the workpeople upon whom his success depends is an astute business man as well as a good citizen. Like all social schemes that are designed to assist the less fortunate members of the community there is always the danger that welfare work may tend to lessen individual self-reliance and foster a dependency upon others that is bad both for the individual himself and for the State. Therefore, assistance should supplement, but not replace, the individual efforts of the employee to make adequate provision for himself and his dependents. In all insurance schemes it is essential to their success that they should be drawn upon as little as possible, only in emergencies, and not at regular intervals as a reward for abstention in the interim. In America the view is held that 'wealth is not *in* industry, but that wealth *is* industry, and that every single thing given for nothing or in return for inadequate service is, in effect, so much actual poverty grafted on to the nation. Thus, abuse of any system of insurance is wilful robbery of other people's livelihood and high treason against the State.'

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[1] A lecture to the Public Health Division, London School of Hygiene and Tropical Medicine, on May 29th, 1931, by N. Howard Mummery, M.R.C.S. Eng., Lieut.-Col., late R.A.M.C. (Temp.); medical officer in charge, Cadby Hall Clinic, J. Lyons and Co., Ltd.

Industrial Health Research Board.

"The Industrial Health Research Board owes its origin to the Health of Munition Workers Committee set up during the war. That Committee, in 1916, recommended that proper organisation of medical services in factories was essential not only for the health of the operatives, but in order to secure improved production and output by preventing loss of time and efficiency among the workers. The Board has the responsibility of investigating such problems as the relationship of age to capacity for work; the influence of diet, alcohol, nutrition, and other factors upon human efficiency; the maximum loads, height of work-benches and chairs most desirable, and, generally speaking, the application of physiology to industrial processes. It places the resources of physiological, psychological, and medical science at the disposal of industrial management. With the individual firm's welfare department and medical officer, however, rests the actual detailed work which a solution of all these problems demands, and in actual practice it is found that many theories, apparently excellent in principle, have to be modified in their application to industrial processes before they are acceptable to the management. Any drastic alteration usually involves initial expense and arouses prompt opposition, frequently from those whom it is most designed to assist. Therefore, physiologists and medical men need to appreciate more fully their need of a wider knowledge of industrial management and industrial processes if their knowledge is to be of the fullest possible assistance to industry.

Industrial Welfare Clinic.

"It will readily be understood that the comprehensive task of caring for factory personnel necessitates the welfare department of a firm interesting itself in almost every factory activity. It is concerned with the engagement and discharge of workers; with their medical examination to determine fitness for the particular job; with the prevention and cure of injuries and illness; with the lighting, heating, ventilation, and cleaning of workrooms; with the working clothing of factory operatives whose almost ineradicable preference for the shoddiest of footwear is so largely responsible for colds and rheumatism; with feeding, housing, and recreation; and, in a large concern, with continuation schools, handwork guilds, and even in creating a social life for its employees by means of clubs and sports-grounds. Its activities extend beyond the factory precincts into the homes of the workpeople, where the welfare visitor keeps in touch with them during illness, and into the hospitals and other institutions into which they may go.

"Welfare work necessarily must vary widely with, and be governed by, the size and resources of the individual firm; by the urban or rural distribution of its employees, and by the policy of its directors. It varies indeed from the statutory first-aid box per 150 employees, at the bottom of the scale, to the provision of an up-to-date hospital clinic, comprising doctors, nurses, dentists, masseurs, at the top of the scale. Many of these welfare activities are in the hands of the lay superintendent and assistants of the department, and I am confining myself to those which more directly come within the scope of the clinic attached to it. The lay-out or plan of such a clinic is important. It should be easy of access from all parts of the factory, and as far as possible away from noise. The essential features are: A waiting-room with seating accommodation under clerical supervision, with an ample filing-room near the entrance. Each employee on arrival and departure is given a time check showing the time spent at the clinic; this he takes back to his manager with any necessary report from the medical officer. Details of every attendance at the clinic are carefully recorded on clinical cards, which, together with the medical officer's notes of condition on engagement, previous illness or injuries, and all other relative documents, are kept in cardboard folders in the filing-room. The surgery, fitted with basins, foot-bath, hot and cold running water, and necessary tables, chairs, cupboards, &c., should communicate through a curtain with the doctor's consulting-room, and on each side of the inter-communicating doorway should be a small dressing-room containing a couch and chairs. These are invaluable when patients have to be got ready for examination. A separate rest room for serious cases is also a necessity. The equipment of the doctor's room should include facilities for vision testing and most of the ordinary aids to clinical diagnosis, among which an X ray apparatus will be found particularly valuable."

FUNCTIONS OF AN INDUSTRIAL CLINIC.

These, said the lecturer, include all means, preventive and remedial, taken to reduce to a minimum the working time lost by employees owing to illness and accidents.

The Medical Examination.

"First in importance is the medical examination of all candidates for employment, carried out with special regard to the nature of the work—not in order to select only the fittest and reject all those who have disabilities, but rather to place all candidates with satisfactory references in work at which the defect or weakness will not be aggravated, unduly increase the industrial risk borne by the employer, nor prove a bar to efficient and profitable employment. Few people are completely healthy, and Dr. René Sand has stated (THE LANCET, August 23rd, 1930) that though 80 per cent. have healthy hearts, lungs, and kidneys, normal weight and posture are enjoyed by less than 50 per cent. of people who think themselves fit; less than half have normal vision, normal teeth, or a normal nasopharynx; and about 40 per cent. have habitual constipation. Actually the number of applicants rejected is surprisingly low. In 1929 I examined 2675 men and women for employment, and rejected only 3 per cent., and in 1930 2415 with 2·4 per cent. of rejections. The factory doctor undertaking this vocational selection must be familiar with the various processes of manufacture and distribution in his factory, and will have tabulated these processes, recording against each group of workers the disabilities which should prohibit such employment, and what special attributes each process calls for. He will have tried to discover any special capacity or characteristic, or even physical disability, that is common to the best workers in any group and lacking in the others, and will endeavour to pick out for employment those who seem to possess it. A few illustrations will serve. Telephone operators should be of average height to work comfortably at the exchange switchboard; they should have well-developed back muscles, good hearing, and memory for spoken numbers, good sight, and a clear enunciation, be capable of sustained attention with a short time reaction, and an equable temperament, and be free of naso-aural-pharyngeal disease. Motor drivers are required to have a minimum vision of six-twelfths normal in each eye, and to be free of corneal opacities likely to occlude the contracted iris in a bright light at night. Epilepsy, petit mal, cardiovascular disease, or marked deafness is a disqualification. Bakers, pastry-cooks, confectioners, and others exposed to recognised trade irritants, call for special attention to the skin state, any marked degree of seborrhœa, ichthyosis, hyperidrosis, or endocrine-sympathetic unbalance, causing chilblains and purple extremities, being disqualifications. Cleaners and scrubbers are exposed to soda irritation and water maceration of the hands, and to tibial bursitis from kneeling. Special attention, therefore, is directed to the state of these parts. Porters are specially examined for hernia and as to general development. Waitresses require examination for signs of weak spinal muscles tending to scoliosis, which is apt to develop from carrying heavy trays on the left arm, and for any tendency to pes planus, which is common among them. Naturally, the doctor is supplied, on a convenient form, with particulars of the employment suggested. Working on a definite routine with the aid of trained nurses, who, in the case of women and girls, make a complete preliminary inspection, these examinations can be carried out rapidly and with a surprisingly high degree of accuracy in spite of the fact that where large numbers have to be seen the scope of the examination cannot always include urinary and certain other desirable tests unless there is reason to suspect their special desirability. No opposition to these examinations has been experienced, either from the individuals themselves or from trade-unions, and it is difficult to understand how there could be any when the object of the examination is so clearly in the interests of both.

Periodic Re-examination.—Examination on Return.

"The periodic re-examination of young or underdeveloped persons and of those exposed to special occupational risk is essential. This includes the weekly inspection of the skin of all workers handling sugar, flour, dough, cream icing, and other known irritants. As will be mentioned later, the weekly manicure of such employees also provides a valuable means of watching for early signs of dermatoses and referring them to the medical officer. The record of weight taken on engagement provides a valuable means of checking the physical development of young persons, a very large number of whom are employed in clerical departments of my firm. The re-examination, in modified form, of employees on re-engagement on temporary or seasonal staffs should be carried out.

The examination on return from illness is hardly less important. The factory doctor, knowing the nature of the patients' employment, is favourably placed to judge of their fitness to resume work, and it is found that, far from his duties in this respect being a source of friction with the panel medical practitioner, the latter very often sends the employee to the factory doctor before issuing the final certificate of fitness for work. This routine visit of all sick absentees to the clinic on leaving or resuming work acts as a very wholesome check on unnecessary or unduly prolonged absence, and when, as is the case with my firm, the management grants wages, less panel sick benefit, during sickness, in accordance with a scale dependent upon length of service and a satisfactory report on each case from the factory doctor, there is every encouragement for recovery and little opportunity for malingering. It also enables the firm's medical officer to safeguard other employees from the premature return of those suffering from infectious diseases, and this raises the very interesting problem of quarantine of contacts with these diseases. Except in scarlet fever, where there has been close contact with the disease, and the usual period of quarantine is generally advisable, exclusion from work usually appears unnecessary, though one considers whether the contact works in the open or in a room with young and susceptible persons. Variola contacts, with the agreement of the district medical officer of health, are allowed to resume duty after revaccination. Diphtheria contacts, especially if negative throat swabs have been obtained, may generally continue at work, but for a week have the throat examined by the factory nurse each day before commencing duty. Contacts with measles, rubella, varicella, and mumps are allowed to remain at work provided they keep out of the sick room. Public conveyances and cinemas are such prolific sources of infection that the rigid exclusion of contacts from factories appears to me a useless waste of working time, and so far the above measures have never failed to prevent the diseases spreading in the factory. On the other hand, great care is taken in regard to any possible infection from an occasional case of enteric or paratyphoid fever and to detect any carriers of these diseases.

Diagnosis and Treatment of Minor Illness.

"Such medical emergencies enter largely into the work of the clinic. What chiefly is required of the doctor in charge of a factory clinic is a sound general experience of clinical medicine and surgery, the ability to make a prompt diagnosis and to reach quick decisions. He sees a great number of apparently trivial cases among which, at any time, usually when he is most busy, may be one with the early signs or symptoms of a grave condition, such, for instance, as an acute mastoiditis, a perforated duodenal ulcer, strangulated hernia, or an acute appendix. It is no use sending such cases home to the panel doctor, who may be out and unable to see the case for some hours, consequently the factory doctor has to find a bed for them in hospital and arrange for transport there. This is when previous working coöperation with the nearest hospital comes in so useful, and reciprocal arrangements are easily made in view of the fact that the work of the clinic relieves the hospital of so much of its other work, as I will explain shortly. In a large concern the firm must have its own motor ambulance. The medical officer finds that his advice and guidance are sought regarding a multitude of health problems, the answers to which have to be given definitely and often by telephone. He must know which specialist to recommend in any particular case, what days of the week certain departments of hospitals see patients, where beds are available, what to do with a case of mumps, how to disinfect a room, what the various diagnoses on panel certificates really mean, and how long incapacity is likely to last in various complaints. Sometimes he may have to see between 70 and 90 patients in a day, and always he will find the work extremely exacting though full of interest. He has opportunities enjoyed by few of his professional colleagues for preventing avoidable disease, for detecting the earliest signs of impending illness, and for assisting to build up healthy, happy, useful citizens. His knowledge and experience should enable him to estimate the capabilities of the individual worker, to guard him against injustice, and to protect the employer from imposture. His position, moreover, is largely privileged and gives him certain advantages in dealing with refractory patients that are denied to panel or private practitioners, for, unlike them, he can, should occasion arise, be candid without fear of consequent unpopularity."

[Colonel Mummery explained the method in which, under his own particular organisation, while the actual treatment is left to the practitioner or the hospital, a welfare visitor keeps in touch with the patient; but in regard to the treatment of injuries, where he noted the recent increase in figures and mortality, he pointed out the value of treating these at the clinic, where the employee was able to continue his work or lived nearby. He described the facilities furnished at his own clinic, and pointed out that the economy of time thus ensured was a valuable asset in industry. When further assistance than the clinic could render was required he found that the splendid work of the voluntary hospitals too often did not meet the case, and he suggested that another kind of hospital or after-care centre was what the factory clinic should provide, where the remedial work would help the employee and the industrial manager, and the covering insurance companies would be satisfactorily informed.

After commenting on the valuable work that can be done at the industrial clinic in the detection of cutaneous disorders, he continued :—]

Special Treatments at the Industrial Clinic.

"Dental sepsis is responsible for so much ill-health and absenteeism that it is unwise to pass applicants with serious dental caries or pyorrhœa until these conditions have been corrected. It is a sound rule that sick absence due to this cause disqualifies an employee from receiving compassionate financial assistance. The equipment of the dental surgery, consisting of furniture, instruments, and materials, is provided by the firm. At Cadby Hall Clinic we have two part-time dental surgeons giving their services on five days a week. Appointments are made in advance. Treatment includes fillings, scaling, extractions, and provision of dentures. The latter are made in the dentists' own workrooms. All charges are those laid down by the National Health Insurance dental benefit scheme with special terms for those not entitled to that benefit, and extended payments by small weekly deductions from wages are arranged, the firm accepting liability for any bad debts. During 1930 the dental treatments at the clinic numbered 4124.

"An ophthalmic centre is maintained at the clinic for employees. Of recent years many of the National Health Insurance societies have granted ophthalmic benefit to insured persons, sending them to an optician for the correction of errors of refraction. In order to improve upon this arrangement the firm provides the services of a specialist ophthalmic surgeon at the clinic on one evening a week and supplies the spectacles in the orders at a contract price. The firm pays him a salary and collects any panel ophthalmic benefit granted by the society. In other cases time-payment is allowed.

"Massage, radiant heat, high-frequency treatment, and facilities for certain remedial exercises are available at the clinic all day. Great success has attended the treatment here of flat-foot by regular massage and inversion and flexion exercises. Stiff fingers after accidents respond well to the method of pumping coloured water from one bottle to another, and stiff shoulders and arms rapidly regain function with other special forms of exercise. Two fully qualified nurses, holding the certificate of the Chartered Society of Massage, form the staff of this department and also take their turn in the surgery. I have already referred to the value of this work in the factory. During 1930, 2323 massage and remedial treatments were given.

"Manicure is provided free for employees in certain departments of the factory where special cleanliness is desirable or where there is a tendency to the development of cracks or other slight trauma setting up infection—such as among fruit-pickers, who were particularly liable to peri-ungual sepsis before manicure stopped it. Chiropody is available at small charges for the treatment of corns.

"Facilities for consultations with specialists at the firm's expense are available through the medical officer and welfare department, who have made arrangements to that end with consultants in every branch of practice.

Records and Statistics.

"The duty of keeping records concerning the health of the factory staff, and of the incidence of illness and accidents among them, falls upon the welfare department. The staff of the clinic in my medical charge consists of a charge-sister and four other fully trained nurses, two of whom, as already stated, are qualified masseuses. As the work of the factory goes on day and night, one nurse has to be on duty all night, and two are on duty in the surgery during the busier hours of the day. The necessary clerical services, of course, are also provided.

"During 1930, 9995 injuries were treated at the clinic. Of these, 8455 remained at work and 1540, representing 15·4 per cent., were put off duty; 12,748 re-dressings were done, 11,538 of these were during the continuance of employment, and 1210, representing 9·5 per cent., while away from work; there were 2255 attendances of skin cases of all kinds, 1797 of these while at work, and 458, representing 20·3 per cent., during absence from work. (In this connexion I must state that I insist upon a short absence from work in all acute skin diseases because I find it considerably shortens the duration of the complaint and ultimately saves lost time.) 12,258 cases of illness were seen and treated; 9446 of these remained at work, and 2812, representing 23 per cent., were sent home; 2415 persons were medically examined for employment; 1033 patients from outlying hotels, corner houses, and tea shops were seen in consultation.

"I have tabulated the various causes of absenteeism amongst the factory operatives during 1930, showing the number of cases amongst males and females, respectively, the lost time, and the average duration of absence in each case. It should be noted that amongst these operatives the males exceed the females in number by about 2000. My table shows that acute respiratory diseases account for the largest number of cases affecting the sexes fairly equally, there being 1157 cases in all, with a total of 12,510 lost days, giving an average of 11 days per case. Acute gastritis and gastro-enteritis come next in frequency, affecting females much more than males, with a total of 504 cases and 4615 total days lost, giving an average of nine days per case. Fibrositis was more prevalent amongst the males, the total number of cases being 261, and the total days lost 4368, with an average of 17 days per case. Diseases of the ear, nose, and throat were more common amongst the females, with a total of 265 cases, and 3189 lost days, giving an average of 12 days per case. Furunculosis was about three times as common among the males as among the females. There were 128 cases and 1648 lost days, with an average of 13 days per case. Neuritis predominated among the females, but the males, on account of the larger incidence of lumbago and sciatica among them, were longer away from work than the females. The latter, on the other hand, suffered more from brachial neuritis, which, however, cleared up more quickly. There were 106 total cases, with 1058 days lost, and an average of 10 days per case. Genito-urinary diseases were almost entirely confined to females. Tubular disease, uterine displacement, and true dysmenorrhœa accounted for most of the cases, the total number of which was 197, and the total days lost 1345, giving an average of seven days per case. Very few cases of venereal disease in either sex occurred. Taking into account the number of males and females employed as factory operatives, the incidence of accidental injuries was fairly equally distributed between the sexes, and the average of 13 lost days per case from this cause compares favourably with published statistics.

Conclusions.

"At the beginning of this lecture I mentioned that Sir George Newman's report showed that the insured population of England and Wales lost on an average 3·73 weeks working time per annum, and Sir Thomas Oliver (*Journal of State Medicine*, August, 1930) states that during the past 30 years the length of sickness has increased from 16½ days to 28 days. It is interesting to compare with these figures for the insured population of the country as a whole those of my clinic, which are as follows. The factory staff lost on an average 13 working days each in 1929 and eight days each in 1930. The average duration of absence on account of illness in 1929 was 15 days, and in 1930 it was 12·7 days. The average duration of absence on account of injuries in 1929 was 13·3 days, and in 1930 it was 13 days.

"The clinic I have been referring to is the chief clinic of a very large firm with a factory and clerical staff numbering 6132, and, in addition, the clinic serves in some degree also the firm's 30,000 employees scattered throughout London. It even serves to some extent numerous other employees in the provinces, and even in Ireland, for travellers and motor drivers are sent for examination on engagement, and special cases may be sent to Cadby Hall Clinic for assistance. The organisation is not necessarily applicable to other firms. I have outlined, however, a scheme of services which can be modified to meet most needs, and have laid special stress on those which have proved most valuable both to employer and employee. For the past seven years, during which time the present welfare organisation of my firm has been built up, I have been able to watch the steady improvement in the health and general condition of its employees. As the attendances at the factory surgery have increased, the absenteeism has decreased; with much better dental hygiene the incidence of gastritis, lumbago, and other varieties of fibrositis has fallen; and, whereas in the early days pediculi and other human parasites were not infrequently seen, they are now only conspicuous by their absence. The crying need of industry to-day, however, is for some means of controlling effectually the common complaints, such as epidemic nasal catarrh, bronchitis, epidemic influenza, and rheumatism, which together are responsible for so much absenteeism and are so serious a burden on industry. Yet, like many others, I have carried out extensive and carefully controlled experiments with vaccines and nasopharyngeal prophylaxis in an attempt to reduce the incidence of epidemic coryza, but with entirely negative results; and furunculosis, lacking as it does any common causative factor, is also at present outside the scope of our preventive methods."

THE DRESDEN HYGIENE MUSEUM.

ALTHOUGH a beginning has been made in this country in the provision of museums for teaching hygiene to the public, these as a rule are parts of other buildings not specially designed for the purpose. The Dresden Hygiene Museum has lately been given a home of its own, which is described in the *Museums Journal* for July. The building stands well away from others in a beautiful situation in the heart of Dresden. The plans of the architect, Prof. W. Kreis, provide well-lighted corridors running through the whole museum; the exhibits are almost all placed in rooms on the outer side of the building; these are lit by top-side windows. Monotony has been avoided by giving each of these rooms an individual shape and colour and by using different materials for flooring and walls. For the visitors a rest room, refreshment room, and roof garden are provided. Roughly, half the area of the building is devoted to exhibits; the other is given over to ancillary purposes, workshops and packing rooms, bookshelves, laboratories, store rooms, and a gymnasium. Much help is afforded in the teaching of hygiene outside the museum. In the workshops material for teaching is made; this includes, besides the ordinary anatomical and biological diagrams, posters, lantern slides, and especially casts. These models are almost unbreakable; they can be washed, and are not affected by changes of temperature, and, owing to mass production, are considerably cheaper than wax models. Travelling exhibitions are organised. These have been shown widely over Europe, and a special motor-car has been fitted for smaller exhibitions in the lesser towns and villages. Another section produces its own films. In the same building is the Academy of Hygiene, the head of which is Prof. Weisbach, in which teachers of hygiene are trained.

Three million people visited the International Hygiene Exhibition in Dresden last year. The exhibition has been repeated this year, and will go on to the end of September.

HOLIDAYS FOR WORKING WOMEN.

THE following letter reaches us from the offices of the Women's Holiday Fund:—

"May we again appeal on behalf of the working women of London for the generous help of those of your readers who are now enjoying, or about to enjoy, their own holidays? Of all who toil hardest year in, year out, the working-class mother holds the foremost place. Her labours are never done, and in her self-sacrificing life there is little room for any sort of recreation. A holiday means to her not only respite from work but often restoration to health, and it is in consequence a necessity rather than a luxury. Last year the Women's Holiday Fund (founded in 1895) sent away 1154 women and 640 children. Whether or no the same number can be helped this year depends largely on the result of this appeal. The women pay as much as they can afford towards the cost of the fortnight's holiday, many of them putting by a few pence each week in order to do so. Donations, large or small, will be most gratefully received by the Secretary of the Fund, 76, Denison House, Vauxhall Bridge-road, London, S.W.1."

The appeal is signed by Lady Maud Carnegie, the Bishop of London, the Rev. F. C. Devas, S.J., the Rev. J. Scott Lidgett, Sir George Blacker, F.R.C.P., and Mrs. Frank Pownall (Chairman of Executive Committee).

Medical Diary

Information to be included in this column should reach us in proper form on Tuesday, and cannot appear if it reaches us later than the first post on Wednesday morning.

SOCIETIES.

PADDINGTON MEDICAL SOCIETY.

The next meeting will be held on TUESDAY, July 14th, 9 P.M. (at the Great Western Royal Hotel, Paddingto W.): Discussion on Maternal Mortality, to be ope by Dr. G. E. Oates, Mr. T. G. Stevens, and Dr. Leon Colebrook.

LECTURES, ADDRESSES, DEMONSTRATIONS, &c.

FELLOWSHIP OF MEDICINE, 1, Wimpole-street, W.

MONDAY, July 13th to SATURDAY, July 18th.—PRIN OF WALES'S HOSPITAL, Tottenham, N.15. Seco week of post-graduate course in general medicine a surgery. Daily 10.30 A.M. to 5.30 P.M., demonstrati lectures, operations.—Further particulars from Fellowship of Medicine.

WEST LONDON HOSPITAL POST-GRADUATE COLLEGE, Hammersmith, W.

MONDAY, July 13th.—10 A.M., Gynæcological Ward Visit Genito-Urinary Operations, Skin Department. 11 A.M. Surgical Ward Visit. 2 P.M., Surgical Ward Visit Medical, Surgical, Eye, Gynæcological Out-patients

TUESDAY.—9.30 A.M., Operations. 10 A.M., Medical Ward Visit, Dental Department. 11 A.M., Throat Operations 11.30 A.M., Surgical Clinical Demonstrations. 2 P.M. Medical, Surgical, Throat, Out-patients, Operations Medical Ward Visit.

WEDNESDAY.—10 A.M., Medical Ward Visit, Children's Medical Out-patients. 2 P.M., Medical, Surgical and Eye Out-patients. Gynæcological Operations. 4.45 P.M., Venereal Diseases.

THURSDAY.—10 A.M., Neurological Department. 11.30 A.M. Treatment of Fractures. 2 P.M., Medical, Surgical, and Eye Out-patients. Genito-Urinary Department, Operations.

FRIDAY.—10 A.M., Medical Ward Visit, Skin and Dental Departments. 12 noon, Medical Lecture. 2 P.M. Medical, Surgical, and Throat Out-patients. Operations.

SATURDAY.—9 A.M., Throat Operations. 10 A.M., Medical Ward Visit, Surgical and Children's Medical Out-patients.

CHARING CROSS HOSPITAL MEDICAL SCHOOL POST-GRADUATE COURSE.

SUNDAY, July 12th.—10.45 A.M., Dr. R. A. Hickling: The Investigation and Treatment of Cases of Severe Anæmia. 11.45 A.M., Dr. H. G. Everard Williams: Physiological Principles in Gynæcology.

ST. MARK'S HOSPITAL, City-road, E.C.

THURSDAY, July 16th.—4.30 P.M., Sir Charles Gordon-Watson: Carcinoma of the Colon.

UNIVERSITY OF BIRMINGHAM.

TUESDAY, July 14th.—3.30 P.M. (at the Children's Hospital), Prof. Parsons: Demonstration of Cases of Children's Diseases.

FRIDAY (at the Queen's Hospital).—3.30 P.M., Dr. J. F. Brailsford: X ray Investigation of Alimentary Canal.

ADDRESSES AND ORIGINAL ARTICLES

TOXIC JAUNDICE.[*]

BY SIR WILLIAM WILLCOX, K.C.I.E., C.B., C.M.G., M.D., F.R.C.P. LOND.,
PHYSICIAN TO ST. MARY'S HOSPITAL.

LECTURE III.

THERE is no variety of toxic jaundice produced by known chemical exogenous poisons for which an exact counterpart may not occur from biological toxins, and the converse is also true. The morbid anatomical and histological changes in the liver may be precisely the same under the two conditions. The bacterial infection may be that of a micro-organism the characters of which are generally accepted as specific or from one of a group of organisms, such as the streptococcal group, the specificity of which is indefinite.

Enteric Group Disease.

Typhoid Fever.—Jaundice is well recognised as a complication of this disease. Osler[35] quotes from his series of 1500 cases the occurrence of jaundice as 0·5 per cent. and that of cholecystitis as 1·3 per cent. In the epidemics of typhoid fever which occurred in the East during the late war jaundice was certainly more frequent than this. Usually the jaundice occurred during the height of the fever, and resembled in its course that of epidemic catarrhal jaundice superadded to the typhoid fever attack; its presence did not seem to add seriously to the gravity of the prognosis unless it was associated with acute cholecystitis.

The cause of the jaundice appears often to be an ascending infection, causing catarrhal inflammation of the intrahepatic bile-ducts, though no doubt the liver cells may be acted upon directly by the toxins in the circulation and jaundice arise thereby.

A case of typhoid under my care in March, 1931, is of interest.

CASE 27.—Mr. X, onset Feb. 5th, 1931. Temperature 103°F. *B. typhosus* was found in the blood on Feb. 7th and 11th. The case ran the usual course of an acute typhoid attack. On Feb. 18th an acute attack of abdominal pain occurred, associated with sudden collapse and drop of temperature to 97°; the clinical symptoms resembled those of intestinal perforation. On examination of the abdomen no signs of peritonitis were found, but the gall-bladder could be felt projecting forwards like a distended sausage skin. Sir Crisp English saw this case with me and confirmed the diagnosis. Hypodermic administration of atropine and local fomentations were followed by a rapid disappearance of the symptoms, of which there has been no recurrence.

Paratyphoid Fevers A and B.—These diseases were extremely common during the Dardanelles and Mesopotamian campaigns. Jaundice was comparatively frequent, probably occurring in more than 5 per cent. In fact, so frequent was it that some observers suggested that epidemic catarrhal jaundice was due to paratyphoid infection, but this assumption was not borne out by the bacteriological investigations. Jaundice occurred in both paratyphoid A and B cases.

In enteric and paratyphoid fever the commonest time of onset is towards the end of the second week. I have, however, seen cases, the diagnosis of which was confirmed by positive blood culture, in which jaundice occurred within the first six days, and in a few it was present at the onset of the symptoms. In one case it did not occur until the twenty-ninth day of the disease.

CASE 28.—One case seen by me in 1915 in the Dardanelles was under the care of Captain C. H. Corbett, R.A.M.C. The patient developed jaundice on the third day after admission to hospital, and death occurred six days later from sudden collapse. At the post-mortem examination the mucous membrane of the duodenum was found to have a red velvet appearance, and the walls of the common bile-duct and hepatic ducts showed acute inflammation; the gall-bladder was distended with semi-purulent greenish bile which contained paratyphoid B organisms.

I have seen toxic jaundice in more than one case during the severe febrile reaction lasting several days which followed a full dose of prophylactic typhoid vaccine. This shows that a blood-borne toxic jaundice may follow typhoid infections, quite apart from an ascending inflammation by the bile-ducts.

Parenteric Infections.—A group of non-lactose fermenting coliform bacilli very closely resembling the typhoid bacillus but differing from it in certain sugar-fermenting reactions and in serum agglutination tests is included in this group. Examples are: *B. asiaticus* and *pseudo asiaticus*, *B. fæcalis alkaligenes* and *pseudo-fæcalis alkaligenes*, the bacillus of epidemic jaundice, and Morgan's bacillus. These organisms may give rise to an acute illness closely resembling typhoid fever clinically, the organisms being found in the blood, the stools, and urine. In 1917 in Mesopotamia an outbreak of illness presenting the clinical symptoms of typhoid occurred in five members of a mess. Those cases which were seen by me, were fully investigated bacteriologically by Lieut.-Colonel F. P. Mackie, I.M.S., and the organism found responsible for them was *B. fæcalis alkaligenes.* Similar outbreaks due to *B. asiaticus* have occurred in Egypt. I have met with many cases of illness of a typhoid-like character where the bacteriological findings have confirmed the presence of one or other of this group of organisms as the causal agent.

The illness "parenteric fever" usually runs a much shorter course than typhoid and is not associated with the symptoms of intestinal ulceration though the characteristic spots and enlargement of the spleen are commonly observed and jaundice may occur.

This group of organisms is often associated with abdominal symptoms of a chronic or subacute type, such as jaundice, cholecystitis, enteritis, colitis, and hepatitis. Attention was called to parenteric infections in a paper published by me in June, 1927.[36] Numerous cases of chronic toxic jaundice have been under my care where the bacteriological examination of the stools has shown the presence of one of this group of organisms and where a definite serum agglutination reaction of high value has been given.

CASE 29.—A medical man under my care at St. Mary's Hospital in 1928 had been for a holiday in France and returned with jaundice of a mild toxic type. *B. asiaticus* was found in the stools and a serum agglutination reaction of 1 in 250 was given to the organism found.

I am fully aware that organisms of the parenteric group are very commonly found in the stools of persons who have been abroad, especially in tropical countries, and that these organisms may exist apart from any symptoms of illness; in other words, "carriers" are comparatively common. The conclusion that a member of this group is responsible for jaundice in a given case must not be arrived at hastily. These infections may cause an alteration in the agglutination reaction to typhoid or paratyphoid A and B, and so may lead to the incorrect assumption that enteric group disease is present. I have come to the conclusion that agglutination reactions alone are of little or no value in making a diagnosis of enteric group disease; they must be confirmed by other findings, such as blood culture, the presence of the organisms in the excreta, and leucopenia.

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[*] The Lumleian Lectures delivered before the Royal College of Physicians of London on March 19th, 24th, and 26th, 1931. Lectures I. and II. appeared in THE LANCET of July 4th and 11th respectively.

In some cases of chronic toxic jaundice of intestinal origin *B. coli communis* may play a causative part.

CASE 30.—A man, aged 46, was seen on Sept. 19th, 1930. He gave a history of liver attacks every few months for 20 years, often associated with mild jaundice for some days, and discomfort in the right hypochondrium, but no actual pain. The liver was enlarged and smooth, reaching 2 inches below the subcostal border in the right nipple line. There was no history of alcoholism or syphilis, and the Wassermann reaction was negative. Radiography of the gall-bladder after tetraiodophenolphthalein showed nothing abnormal. Bacteriological examination of the stools by Dr. A. Fleming showed hæmolytic and non-hæmolytic *B. coli*, the latter giving a positive agglutination reaction with the serum of 1 in 120. The toxic jaundice was apparently due to this infection.

In this case the administration of alkalis, liver extract, and glucose, and inoculations with an autogenous *B. coli* vaccine, have been followed by a complete disappearance of the symptoms and signs.

Food-poisoning Organisms.—These are closely allied, morphologically and culturally, with the parenteric group of organisms. Clinically they are entirely different, for they give rise to acute enteritis, the latent period of the symptoms being very short: a few hours up to three or four days. The organisms are known as the "salmonella group," and the two chief are *B. aertrycke*, of which there are many strains, and *B. enteritidis* (Gaertner's bacillus), of which many strains have been described. Occasionally the dysentery bacilli, such as the bacillus of Shiga or of Flexner, may give rise to acute food poisoning.[37] Food-poisoning infections are not infrequently associated with toxic jaundice, a typical case of which is the following.

CASE 31.—A man, aged 40, was seen by me in consultation with Dr. A. H. Thomas on July 26th, 1928. He had enjoyed fairly good health, and had been accustomed to take alcohol fairly freely but not to excess. Two teeth has been removed on July 17th, after which somewhat unusual bleeding had occurred, but not sufficient to require medical attention. On July 19th he had eaten a ham sandwich at a restaurant. He had thought this was not good, and shortly afterwards had experienced nausea and abdominal discomfort. On July 20th he had consulted Dr. Thomas, and his temperature had been 99° F. On July 23rd a macular rash had appeared on his chest. On July 25th he had slight jaundice and a temperature of 100°. Diarrhœa and pyrexia continued. On July 26th he was drowsy, delirious, and incontinent of fæces and urine, and showed ptosis of the eyelids. This patient was also seen by Dr. Geoffrey Evans and the clinical diagnosis of food poisoning was made. Bacteriological examination of the stools showed an infection with one of the salmonella group. The patient died on July 27th from symptoms of hypohepatism and toxæmia.

The case was reported to the coroner. Post-mortem examination by Dr. Newcomb showed acute gastro-enteritis. The liver was large, pale, and flabby, and showed marked fatty degeneration. Cloudy swelling of the kidneys and suprarenals was present. Cultures from the spleen showed a marked infection with one of the salmonella group of organisms.

In this case the cause of death was acute food poisoning; possibly the toxæmia associated with the dental extractions and the history of moderate excess of alcohol were contributing factors. A point of interest in the case was that at the time of the illness numerous cases of food poisoning from infected ham had occurred in London, several of them in the police force.

Influenza.—The occurrence of jaundice in influenza, especially in the gastro-intestinal type, has been long recognised. Epidemics vary greatly as regards the occurrence of jaundice; in some it may be relatively common, but usually it is absent or very rare. Sir Wilmot Herringham in 1919[38] pointed out that in the epidemic of influenza in March, 1919, jaundice became for the first time a fairly frequent symptom.

Pneumonia.—Jaundice, like influenza, occurs with irregularity in outbreaks of pneumonia; usually it is rare, but in some outbreaks it may be not uncommon. It is usually of toxic type and due to the action of the pneumonia toxins in the liver cells.[39]

Streptococcal Infections.—Toxic jaundice has been observed on many occasions during the acute streptococcal infection associated with tonsillitis or sinus inflammation in the nasopharynx, and in cases of dental infection.[40] In acute streptococcal septicæmia toxic jaundice sometimes occurs, owing to the action of the circulating toxins on the liver cells. The jaundice of streptococcal infections is sometimes of the hæmolytic type, and then an indirect van den Bergh reaction is given. The following two cases are illustrative.

CASE 32.—A man, aged 57, gave a history of recurring gout for years. "Influenzal attacks" often occurred two or three times a year. He had been treated for flatulence and dyspepsia from time to time for the last year. From May 20th to May 22nd, 1927, he had malaise and fatigue. On May 23rd his temperature was 100° and he had jaundice. On May 27th he developed pneumonia in the middle and lower lobes of the right lung, and the jaundice was more marked. Bacteriological examinations by Dr. John Freeman showed a streptococcal infection in the sputum and stools. The Wassermann reaction was negative. On June 2nd the van den Bergh test showed a very marked biphasic reaction. The icterus index was 150 and the blood-urea 134 mg. per 100 c.cm. The urine had a specific gravity of 1020 and a urea content of 2 per cent. It showed a cloud of albumin and large numbers of granular and epithelial cases. Bile-pigments and bile-salts were present. The stools were clay-coloured.

This patient was also seen by Sir Humphry Rolleston and Sir John Rose Bradford, who confirmed the diagnosis of toxic jaundice. On June 5th there were some delirium and muscular twitchings, and the symptoms of acute hypohepatism (icterus gravis) gradually developed in spite of all treatment. Death occurred on June 11th.

In this case the symptoms of toxic jaundice due to necrosis of the liver were combined with those of uræmia due to the poisoned kidneys.

CASE 33.—A married woman, aged 52, with three children, was under the care of Dr. Hugh C. Wilson. In December, 1920, a gastro-jejunostomy was performed for a dilated duodenum, but no ulcer was found. In August, 1921, laparotomy was performed for adhesions. At a subsequent laparotomy in December the gastro-jejunostomy opening was closed and an anastomosis was made between the duodenum and jejunum. In July, 1922, anæmia developed. In September, 1923, the remaining teeth were removed. The patient was first seen by me on Jan. 22nd, 1924. She was suffering from recurring attacks of abdominal discomfort associated with colon spasm and the passage of much mucus. These attacks were accompanied by mild jaundice with hepatic discomfort and an increase in the anæmia. On Feb. 1st, 1924, bacteriological examinations by Dr. A. Fleming showed a marked intestinal infection with *Streptococcus viridans*. The blood picture was typical of pernicious anæmia. A blood transfusion was given on Feb. 2nd. In view of the recurring attacks of abdominal pain the abdomen was opened on Sept. 11th; numerous adhesions were found and a dilated gall-bladder, with one very small stone which was playing no part in the causation of the symptoms. The patient died two days after the operation, internal hæmorrhage resulting, as so often happens after operation in cases of toxic jaundice.

In this case the recurring attacks of toxic jaundice and hepatitis appeared to be due to the streptococcal bowel infection.

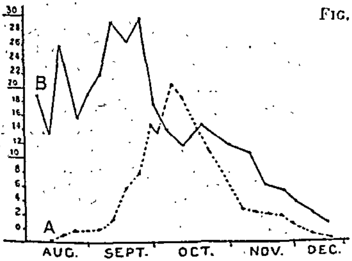
Staphylococcal infections, if of an acute or subacute type, have been associated with toxic jaundice.

Epidemic Catarrhal Jaundice.

This disease occurred with great frequency during the late war. It was most common in those areas where intestinal disease was most rife, for example in the Dardanelles and Mesopotamia. It was generally of a mild type and clinically similar to the cases of ordinary catarrhal jaundice met with in this country; in fact, the diseases are, in my opinion, identical. Gunson and Gunn published [41] an interesting account of a series of cases occurring in British troops at Alexandria in 1915, and I published an account of the epidemic jaundice in the Dardanelles.[42] [49] In 1916 Archibald, Hadfield, Logan and Campbell [43] described their careful work in the Mudros laboratories on the Dardanelles cases, while Martin [44] published an account of the pathology and ætiology of the disease.

An interesting account of a recent epidemic in Yorkshire was published by Pickles.[45] A Ministry of Health report on an outbreak of 200 cases was published in 1927 [46]; in this epidemic there was one death.

FIG. 4.



Incidence rate of epidemic jaundice and diarrhœal diseases in the Dardanelles per 1000 troops in one Division from August 7th to Dec. 19th, 1915. A = jaundice. B = diarrhœal diseases (diarrhœa, enteritis, and dysentery).

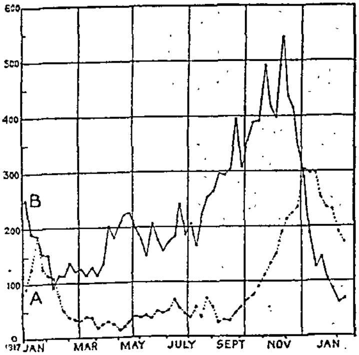
Epidemic catarrhal jaundice is not a new disease. In the American War 22,509 cases occurred, with a mortality of 161, or 0·71 per cent.; in the South African War 5648 cases occurred with a small mortality.

Ætiology.—Bacteriological investigations have, up to the present, failed to identify any specific organism. In some cases coliform organisms of the *B. coli communis* or *B. fæcalis alkaligenes* type have been found. It seems probable that the disease is caused by a catarrhal condition of the duodenum and bile-ducts set up by organisms which are found in health in the intestinal tract. In this way the disease resembles the common "cold in the head," which may be set up by many different catarrhal organisms which are commonly present in the nasal passages in conditions of health.

The disease, like typhoid, does not appear to be contagious from person to person, though many people may become infected from a common cause. The war experience indicates that the alimentary tract is the channel of infection. This is well illustrated by a comparison of the curves (Fig. 4) for epidemic jaundice and diarrhœal diseases in the Dardanelles and Mesopotamia. Pickles suggested that the infection might be air-borne, but this view does not agree with war experience. The disease often occurs in epidemics, but sporadic cases of an identical disease are commonly met with in ordinary medical practice.

Mortality.—In 1917 the Mesopotamian records showed that in British troops the mortality from 1538 cases was 0·6 per cent., while in Indian troops the mortality out of 2633 cases was 0·3 per cent., the gross mortality being 0·41 per cent.

Symptoms.—Usually there is a premonitory period of a few days, associated with nausea and perhaps some occasional vomiting, abdominal discomfort, and diarrhœa; or constipation may be present. The temperature is normal during this period. Pyrexia, usually of a mild type, now sets in, accompanied by chilliness and occasionally shivering; the tongue is moist and often furred. Nausea and vomiting sometimes occur at the onset of the pyrexia, also headache and general pains may be present. Acute abdominal pain is absent, but there is usually some discomfort in the hepatic and epigastric regions. The pyrexial period usually lasts for from two to four days.



Incidence rate of epidemic jaundice and dysentery in Mesopotamia for 1917–18. A = jaundice. B = dysentery.

Jaundice generally appears about the third or fourth day from the onset of the pyrexia. It gradually deepens and becomes of the ordinary obstructive type, with putty-coloured stools and bile-containing urine. It attains its maximum in about ten days and then gradually subsides. It is important to realise that the pyrexial period may sometimes be prolonged (Fig. 5); I have seen it last for 14 days. Also the jaundice may persist for several weeks, even as long as ten weeks, ultimately clearing up. Unless this is realised there is risk of an unnecessary surgical operation on these cases on the assumption that there is obstruction of the common bile-duct. As already pointed out, a surgical operation on a case of toxic jaundice is associated with danger, and fatal hæmorrhage not infrequently results.

In catarrhal jaundice the liver shows a considerable uniform enlargement and is slightly tender up to the time that the jaundice begins to subside and the stools resume their normal colour. It then gradually returns to its normal size. As a rule the gall-bladder cannot be felt, though in a small proportion of cases—about 10 per cent.—it appears to be enlarged. The spleen is enlarged in the early stages of the illness and can be felt extending below the left subcostal border for half an inch or more for a few days from the onset of the pyrexial period. The enlargement quickly subsides.

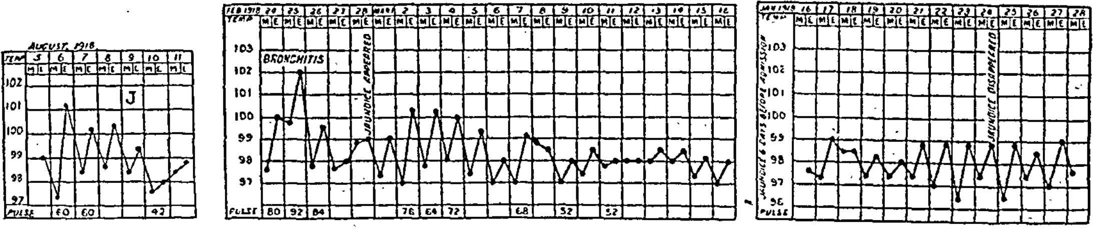
A curious and constant feature of catarrhal jaundice is the definite increase in the deep cardiac dullness in the fourth intercostal space to the right of the sternum. This dullness may extend for an inch or more to the right of the sternal border, and corresponds to a dilatation of the right auricle. There is usually no sign of dyspnœa or cardiac distress, and it seems likely that the increased dullness may be due to a tilting upwards of the heart by the enlarged liver and spleen. X ray examinations should clear up this point.

Usually cases of catarrhal jaundice give rise to no anxiety, but a cautious prognosis should be given, since it is known that fatal symptoms of hypohepatism due to necrosis of the liver occur in from ½ to 1 per cent. of cases. Catarrhal jaundice demands careful treatment and should not be lightly regarded. Rest in bed till the jaundice subsides and a careful diet régime are indicated. Lack of care in treatment increases the risk of necrosis of the liver cells or of the development of a chronic progressive hepatitis.

HYPOHEPATISM AND NECROSIS OF THE LIVER IN CATARRHAL JAUNDICE.

The symptoms of this grave condition have already been described. They usually begin about ten days after the appearance of the jaundice, but in one case they occurred on the second day, in another the fourth day, and in a third the twenty-fifth day afterwards. There appears to be no relation between the depth of the jaundice and the frequency of occurrence of this grave complication. Some cases were not deeply jaundiced at the time of the onset of the symptoms of hepatic failure; also the preliminary symptoms of the illness were exactly like those of the ordinary type of the disease and gave no warning of the future grave development.

FIG. 5.



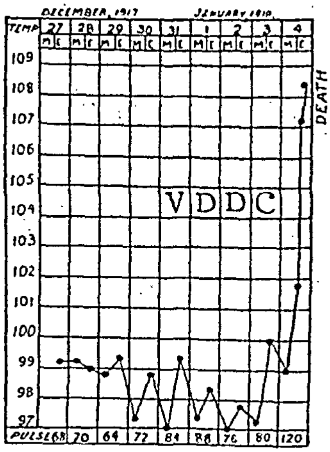
Three cases of epidemic catarrhal jaundice. In the first chart J = time of appearance of jaundice. In the third chart jaundice appeared six days before admission.

One case out of a considerable number of which I have notes might be quoted (Fig. 6).

CASE 34.—Lieut. A. was taken ill on Dec. 24th, 1917, with slight fever and the usual symptoms of epidemic catarrhal jaundice On Dec. 28th his temperature was normal, his liver enlarged and tender, his spleen palpable and slightly tender, and his tongue furred; definite jaundice was now present. The bowels were constipated and the urine bile-stained. The mental condition was normal.

Several attacks of vomiting occurred from Dec. 29th to Jan. 1st, 1918. On Jan. 2nd the vomit contained streaks of blood and was bile-stained. The jaundice was now deep. Restlessness and delirium began during the early morning and throughout the day. On Jan. 3rd he vomited blood-stained material and had epistaxis. The liver dullness was now much diminished, being only two inches vertically in the right anterior axillary line. The patient was very restless and noisy, and his knee-jerks were increased. On Jan. 4th he became comatose in the morning. The urine contained albumin and bile and a few red corpuscles. No spirochætes were present in urine or blood. At 5 P.M. Cheyne-Stokes' respiration appeared, and the plantar reflexes were extensor. At 10 P.M. the temperature suddenly rose to 109°, and death occurred at 10.30 P.M.

FIG. 6 (Case 34).



Epidemic catarrhal jaundice with icterus gravis. Jaundice before admission. V = vomited. D = delirious. C = coma. Post-mortem, "Acute yellow atrophy."

Post-mortem examination by Lieut.-Colonel J. C. G. Ledingham, R.A.M.C., and Major T. Y. Gloster, I.M.S., showed: liver 39½ oz. and stained yellow. Spleen enlarged and soft, kidneys yellowish, small hæmorrhages in the pleura, pericardium, omentum, mesentery, and lungs. The mucous membranes of stomach and duodenum contained petechiæ and the contents were blood-stained.

Microscopical examination showed that there was almost complete destruction of the hepatic cells in blocks; only isolated islets of cells remained. In parts there was total necrosis of all but the trabecular tissue. The kidneys showed extensive degeneration of the tubular cells, and the pancreas early but definite cell necrosis, with shrinkage and loss of outline of the cells that remained; in some places there was a great reduction in the number of cells.

Microscopical examination and animal experiments were specially made for the detection of spirochætes, but were entirely negative.

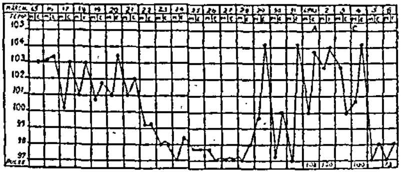
The conclusion arrived at from a study of the clinical symptoms of the disease and from the post-mortem results of a considerable number of fatal cases was that in the majority of cases there was an ascending catarrh of the bile-ducts, leading to a temporary obstruction which was usually intrahepatic. In the more serious cases there was, in addition, a marked degeneration of the hepatic cells which in the fatal cases went on to complete necrosis.

Protozoal Poisons.

Syphilis.—The occurrence of jaundice in this disease is so well known as to need only brief mention. In the acute secondary stage jaundice may be due to the general syphilitic hepatitis accompanied by catarrh of the smaller bile-ducts. In congenital and tertiary syphilis the hepatic fibrosis, whether unilobular, multilobular, or in gross patches forming gummata or scars, is often associated with jaundice.

Relapsing Fever (Figs. 7 and 8).—This disease, due to a blood infection with the spirochæte of Obermeier, is often associated with jaundice.[19] The jaundice occurs quite early, often on the second or third day, and is usually well marked. Captain M. A. Nicholson, I.M.S., from a careful examination of 241 cases in the Isolation Hospital in Bagdad in 1917, found jaundice present in 64 per cent. of cases. The pathology of the condition is analogous to that of the jaundice in secondary syphilis, and the general hepatitis set up by the spirochætes appears to be responsible. Hepatic necrosis rarely occurs.

FIG. 7.

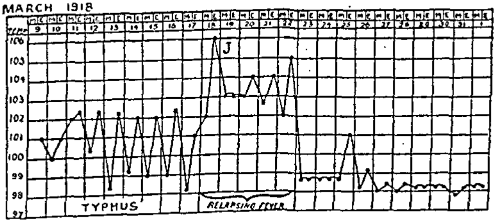


Relapsing fever (Indian), six days' apyrexia. A = blood positive to spirochætes. C = salvarsan 0·3.

Yellow Fever.—In this disease marked cellular necrosis occurs in the liver, often in association with jaundice. The depth of the jaundice is no criterion of the severity of the disease, for it may be slight in the fatal and intense in the less severe cases. Hypohepatism plays an important part in the causation of the grave symptoms. The van den Bergh reaction in cases with marked jaundice was shown by Aitken and Smith[47] to give positive direct results.

Spirochætosis Ictero-hæmorrhagica.—This disease is regarded by Rolleston and McNee as identical with the disease formerly known as Weil's disease. The symptomatology and pathology are quite distinct from that of epidemic catarrhal jaundice, with which there was some confusion during the war. In a report by the Medical Research Council on spirochætal jaundice (No. 113) reference is made to outbreaks which have occurred in Scotland and England. Jaundice, as pointed out by Stokes, Ryle, and Tytler,[48] is not a constant feature of the disease, being present only in 74 per cent. of cases. The van den Bergh reaction is biphasic. The liver does not show the extreme degree of hepatic necrosis found in severe toxic jaundice. When necrosis occurs the destruction of hepatic cells does not appear to be in bulk but is patchy. Fatty degeneration of the liver cells is not a marked feature.

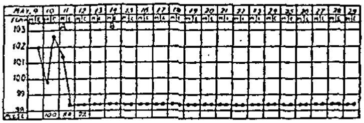
FIG. 8.



Typhus fever and relapsing fever (Arab). J = jaundice.

Malaria (Figs. 9 and 10).—The marked action of the malarial parasite on the red blood corpuscles leads to hepatic and splenic enlargement and anæmia. The hepatitis resulting from a malarial infection is often associated with jaundice, and this is especially so when the infection is of the malignant type. The part played by anoxæmia of the liver cells in the development of jaundice has been already mentioned. For this reason jaundice is much more likely to occur in a patient suffering from a malarial infection when marked anæmia is also present. The liver cells do not suffer the extreme damage and necrosis so commonly seen in toxic jaundice, and as a consequence the development of symptoms of acute hypohepatism is uncommon.

An interesting epidemic of jaundice associated with malaria was investigated by me in September, 1918. At that time a large percentage of the British troops in Northern Persia were infected with malaria and the infection had remained dormant until the influenza epidemic had spread to this region. Towards the end of September many men were attacked by influenza, and this infection stimulated the latent malarial infection into activity, so that the short pyrexial period of the influenzal attack was succeeded or accompanied by the high fever and characteristic symptoms of acute malaria. The liver and spleen were considerably enlarged in a high percentage of these cases, and marked jaundice was a very common symptom. Major C. Christie, R.A.M.C., examined the blood in a large number of these cases and confirmed the diagnosis. He found that in 40 per cent. of the cases of malaria and influenza the parasites were of the malignant tertian type. The combination of the malarial toxins with those of influenza was no doubt the cause of the *intense toxic action* on the liver and of the resulting unusually high incidence of jaundice.



Relapsing fever (Arab). A = blood positive to spirochætes. B = salvarsan 0·3 g.

Blackwater Fever.—A type of malaria associated with intense destruction of the red blood corpuscles and hæmoglobinuria is commonly associated with early jaundice of toxic type. The anoxæmia caused by the severe anæmia is an important added ætiological factor.

Amœbic Dysentery.—The hepatitis so well known to be associated with this infection is frequently associated with jaundice of intrahepatic type.

Typhus Fever.—Jaundice is a rare complication of this disease and was only seen by me in two out of several hundred cases in Mesopotamia.

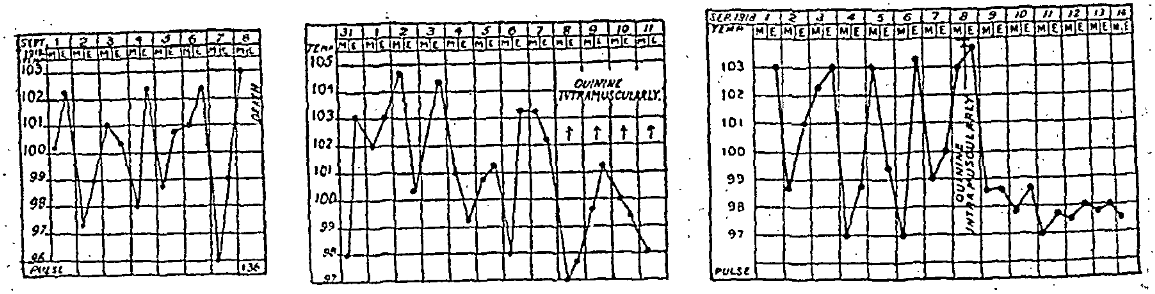
Kala-azar.—This disease, due to the blood infection with leishmanial parasites, is associated with anæmia, *enlargement of the liver and spleen, and prolonged pyrexia.* Jaundice as a result of the hepatitis and blood destruction is a fairly common symptom.

Auto-intoxication.

The Toxæmias of Pregnancy.—These little-understood conditions are manifestations of grave toxæmias of autogenous origin. Intense fatty degeneration and necrosis of the liver is not uncommon, and symptoms of acute hypohepatism, often associated with jaundice, are not infrequent complications.

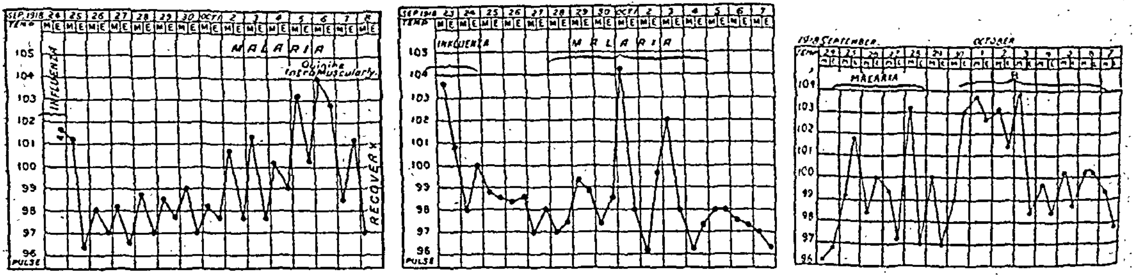
Recurrent Vomiting (Acidosis) in Children.—This condition has been commonly attributed to acidosis and associated ketonæmia. When it is fatal, post-mortem examination usually reveals a large yellow liver showing intense fatty degeneration and necrosis of the hepatic cells. I am firmly of opinion that in these cases the fatty degeneration of the liver is not the result of the acidosis at all. The true explanation is to be found in the presence of some underlying toxic cause, such as infected tonsils or adenoids, intestinal toxæmia or grave errors in diet, whereby the liver degeneration is set up. The resulting impairment of liver function gives rise to prolonged vomiting and consequent lack of nutrition, which is quite an adequate explanation of the acidosis and ketonuria

FIG. 9.



Three cases of malignant malaria with jaundice. The first was fatal.

FIG. 10.



Three cases of malaria and influenza. In the third chart B = consolidation at right apex (tuberculous).

Acholuric Jaundice.—This condition is no doubt due to some auto-intoxication, probably one of the inborn errors of metabolism so admirably described by Sir Archibald Garrod. The jaundice in this condition is the perfect example of hæmolytic jaundice, and the van den Bergh reaction is typically indirect. Anoxæmia plays a part in its causation; in other words, the greater the anæmia the more marked will be the jaundice.

A review of the above types of toxic jaundice shows how varied may be their causes. Frequently in clinical practice a combination of the causes exists, as, for example:—

CASE 35.—A man, aged 45, gave a history of syphilis, and the Wassermann reaction was plus. Between April 4th, 1920, and June, 1922, he received 12 injections of 0·6 g. salvarsan. On Jan. 1st, 1928, he was given 0·3 g. and on Jan. 14th and 28th, Feb. 11th and March 9th, 0·6 g. On Feb. 15th 12 teeth were removed under chloroform anæsthesia, the operation lasting nearly two hours. On March 9th, in the evening after the last injection of salvarsan, the temperature rose to 105° and some vomiting occurred. On March 10th he went to business, fainted three times, was sick once, and had his bowels opened four times. On March 11th he was sick three times and jaundice developed. On March 12th the jaundice was deeper and the temperature was 99·5°. The urine contained a trace of albumin and a trace of acetone. Herpes developed on the right upper lip. On March 13th he was sick twice and had bleeding from the nose and gums. On March 15th stupor, delirium, twitchings, and coma developed, and signs of consolidation of the left lower lobe was marked. He died on March 17th, 1928.

Post-mortem examination showed degenerative changes in the liver cells and a terminal pneumonia of the left lower lobe of the lung.

The ætiological factors in the causation of the toxic jaundice were the salvarsan injections, the streptococcal toxæmia from the dental extractions and the chloroform given as the anæsthetic.

The Control of Poisons.

The consideration of the great variety of drugs in common use which may act as liver poisons and produce dangerous toxic jaundice shows how necessary it is that these drugs should be submitted to careful toxicological and therapeutic tests on the human subjects as well as on animals before they are placed on the market. The medical profession should be fully informed, not only of the therapeutic properties for good of new drugs, but also of the dangers which may arise from idiosyncrasy or overdosage. It cannot be said that this is the case at the present time. The existing system of scheduling of poisons is quite inadequate to keep pace with the rapid developments of the chemical manufacturing industries, which are daily launching new and imperfectly tried complex organic drugs on the market in this country.

As already pointed out, the quinophan group is not even on the Poisons Schedule, and can be sold by any unqualified person and purchased at will by the public without any medical intervention or advice. The system of the control and sale of drugs possessing powerful toxic properties is at present most imperfect and unsatisfactory. The people of this country are exposed to very great danger, for they can have little or no knowledge of the risks associated with new drugs which are advertised as possessing wonderful curative properties and of the toxic effects of which no mention is made.

The Pharmacy and Poisons Bill at present before Parliament proposes to place the control and sale of poisons under the supervision of an advisory committee called the Poisons Board, on which the medical profession will have a representation, which it is hoped will be adequate. This committee, or Poisons Board, will advise the Home Secretary on the steps to be taken whereby there shall be adequate control of the sale of drugs which may possess poisonous properties, and by this means the public should receive that adequate protection which ought to be afforded to it by the Government.

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LATENT MAXILLARY SINUSITIS.

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INFECTION in the accessory sinuses occurs more frequently than is realised. It is especially common in the maxillary antrum, owing to its lack of dependent drainage. The "common cold" is by far the most frequent cause, although occasionally infection develops after influenza, tonsillitis, or even trauma.

The acute infections are ordinarily very obvious processes, and tend to spontaneous recovery. They are really little more than part of the cold with which they appear. Chronic infection is a much more troublesome problem from both the diagnostic and the therapeutic point of view. It is found in three forms—as a frankly purulent sinus, as a sinus with chronically infected hyperplastic membrane, or as a sinus showing polypoidal degeneration of the membrane.

Both acute and chronic infections have a peculiar tendency to the production of secondary complications, the evidences of which dominate the clinical picture while the symptoms referable to the primary focus in the antrum are either absent or surprisingly slight. This condition I have called latent sinusitis. In its recognition a radiological examination is of especial value. Such cases, if examined, may or may not show intranasal indications of the sinus trouble.

It is difficult to estimate the incidence of such silent lesions. The cases reported are the noteworthy cases from a group of 425 in which the sinuses were X rayed during a routine clinical examination. Of these, 100 were found to show clouding of one or both maxillary sinuses. In 46 of these 100 cases the maxillary antrum was punctured and washed out. In 30 pus was obtained. Of the 30, 6 have been classed as absolute cases of latent sinusitis in so far as the primary sinus lesion was totally unsuspected before radiography, while the symptomatology was that of a secondary complication. In the cases quoted these complications included asthma, severe headache suggesting a migraine, exophthalmos, sudden blindness, possible "tic douloureux," and a painless swelling of the glabella.

From these figures it would seem, therefore, that X ray examination of cases in which any suspicion whatever can be directed towards the nose is worth while. Where there is radiographic evidence of clouding of the antrum, diagnostic puncture seems sufficiently justified and, except in the presence of an acute infection, is harmless. In a similar study of 300 cases, Johnson[1] found that where X ray and clinical findings both indicate pus in the antrum, pus is found in 98 per cent. of cases; but that, where the X ray alone shows clouding and clinical substantiation is lacking, 17 per cent. of cases show pus on puncture. This last figure is very similar to my own finding of 13 per cent.

It will be noted that the positive finding of pus in the antrum on puncture is here taken as the only positive proof of antral infection. The condition of those cases in which washings were negative in spite of a positive X ray is left as an open question. Drea,[2] reporting an analysis of 694 sinus cases, describes the appearance produced by polypoidal or œdematous mucous membrane and finds that about 50 per cent. of cases which show clouding are of this nature, and do not contain pus. In his group 99 polypoidal cases were operated on, and the polypoidal condition was found in 95 per cent. I have not been able to obtain an operative check on such cases. Whether this condition acts as a toxic focus in a similar manner to a toxic empyema or not is questionable. Sluder,[3] in his book, finds that the similar condition in the sphenoid—hyperplastic sphenoiditis—certainly acts as a source of considerable trouble. It would probably be safe to say that, even in the absence of pus on diagnostic puncture, a sinus showing clouding in the X ray, associated with definite clinical evidence of lesions similar to those described in this article, should be considered as potential primary lesions and treated. Where pus is found, of course, treatment is often rapidly efficacious, and the general condition of the patient improves considerably.

The importance of the complications of unsuspected antral infection has been considered extensively in the literature; all kinds of conditions from colitis to melancholia have been reported. The subject, however, has practically always been reviewed in any one article from the point of view of one particular type of complication only. A study of this literature suggests that the types of complication can be divided into several very distinct groups. I have outlined the following groups as distinct, and present illustrative cases and a brief résumé of the literature on each.

1. *Orbital.*—Where the structures within the orbital cavity only become affected.

2. *Intracranial.*—With involvement of the central nervous system.

3. *Cranial.*—Where referred pain via the nerves of the face or head dominates the picture.
4. *Thoracic.*—In which the complicating lesion appears as a disease of either lungs or bronchi.
5. *Miscellaneous.*—Including a group which could be further subdivided but into which only the rarer cases fall.

Orbital Complications.

CASE 1.—A stenographer, aged 26, had suffered considerably from abdominal trouble of various sorts for several years, and her health was generally poor. A year before coming to the clinic she had developed a cold, associated with quite definite soreness about the face and head on one side; her face had never felt quite normal since. She also complained of a slight but constantly troublesome cough since that time.

In October, 1929, she came to the clinic on account of her abdominal trouble, and was undergoing a general examination. On Oct. 1st she developed an acute coryza, but this cleared up very rapidly. Ten days later, on Oct. 10th, she complained of loss of vision in the right eye. This had come on comparatively rapidly over three or four days. She was found to have bare perception of light in the right eye; there was also a slight defect in the left eye. She was given a complete ophthalmological examination and was reported as a "retrobulbar neuritis." The following day, however, she was sent for X ray examination of the sinuses and the right antrum was found densely clouded. The leucocyte count was 8500. Although there was no intranasal evidence of trouble, the sinus was washed out and found to be full of pus. For the next two or three weeks the sinus was washed out regularly until the washings were perfectly clear. The vision gradually improved and in the end returned completely to normal.

CASE 2.—A call-boy, aged 18, came to the clinic in March, 1929, complaining of failing vision and of increasing exophthalmos of one eye, of about eight months' duration. Eighteen months before he had suffered a severe blow on the outer border of the cheek-bone and had a "black eye" for two weeks and a hard lump for months. It is impossible to say whether this injury had any relation to the subsequent developments, but no other history suggesting an ætiology for sinus infection was elicited. He was perfectly well for one year after this blow. A year later he found by chance that he had poor vision in the right eye. At that time he had no proptosis. He had a tonsillectomy and several dental extractions done, but without relief. For the six months before he came to the clinic there had been a slowly increasing protrusion of the right eye without any pain. His only other complaint was of occasional nasal discharge and, more recently, of headache.

On examination the boy was found to have a marked exophthalmos and a proptosis of 1·4 mm. downwards and outwards. There was defect of vision on that side, and ophthalmoscopy revealed an œdema around the edge of the right disc with swelling of the disc to 1·5 D. Nystagmus could be elicited on both sides. There was no intranasal evidence of trouble; the leucocyte count was 10,500. A tentative diagnosis of retro-orbital tumour was made at first.

On radiological examination a generalised clouding of all the sinuses on the right side was found and a pansinusitis reported (Fig. 1). Antral puncture was done and pus found. Surgery was advised. The radical frontal operation from the exterior, ethmoidal exenteration, and a "radical antrum" were performed; the orbit was not opened. An extensive infection was found and wide drainage was established. After the operation the sinuses were washed out repeatedly and the eye slowly began to recede, but at the end of four months it had not returned to normal. Nine months after the operation the patient's mother wrote that he had greatly improved. In April, 1930, however, he returned for a re-examination. There was some recession of the eye, but there was still a very definite exophthalmos and some vision defect. The movements of the orbit were, however, quite free and the patient had become able to focus. The nasal condition was good. The patient said that after the first recession after operation the condition had remained entirely stationary.

A study of papers [3–7] on the secondary effects of sinus disease shows a very extensive bibliography dealing with orbital involvement. This is particularly so in cases of infection of the posterior sinus groups, but also occurs with antral infection. The bony walls of the sinuses separating them from the orbital cavity are extremely thin, and there is a common lymphatic drainage system. Luedde classifies the types of lesion found into two groups, "functional" and "pathological." In the first group he places those cases in which the orbital symptoms are probably reflex. These include photophobia, conjunctivitis, blepharospasm, iritis, excessive lacrimation, and so on. Thomson points out the frequency with which this type of lesion occurs and the extreme importance of early diagnosis. Midway between this group and the "pathological" group lie the cases of so-called "retro-orbital neuritis" produced in all probability by pressure on the optic nerve itself, but without any actual intra-orbital abscess. In these cases blindness occurs, but there are no visible changes in the retina. Case 1 is an excellent example of this condition. The girl's sight was almost certainly saved by the early diagnosis and prompt attention. The condition has been likened by Luedde to "a foot gone to sleep." The pressure probably occurs in the bony canal of the optic foramen, and may be caused by a mild lymphatic œdema.

The "pathological" group includes cases of a more serious type. These occur when the infection actually spreads to and involves the orbital contents. This may cause actual inflammatory involvement of the optic nerve or of any of the other orbital nerves, or it may result in a retro-orbital abscess. These conditions will show as loss of vision, exophthalmos, strabismus, or the like. Case 2 is a good example of the "pathological" orbital group of complications. In view of the incomplete resolution after operation, associated, nevertheless, with a total absence of further advance, the strong probability is that the condition was one of retro-orbital abscess. A more complete cure, but with a greater degree of risk, might have been achieved by opening into the orbit from the nasal exposure. The special interest of this case is the entirely latent and painless onset and course in the presence of such a wide infection.

Almost invariably in these cases perimetric charting discloses the presence of quite extensive scotomata, and the occurrence of these, without other obvious ocular lesion and without retinal changes, is more suggestive of nasal origin than of anything else. These conditions are highly important in so far as prompt diagnosis and clearing up of the primary focus will often save vision that will otherwise be lost, either through secondary optic atrophy or by extension of the process to the cavernous sinus. It has been said that the question of operation should be decided rather by the ophthalmologist than by the rhinologist. Davis makes the statement that treatment is even more urgent in this type of case than in acute mastoiditis.

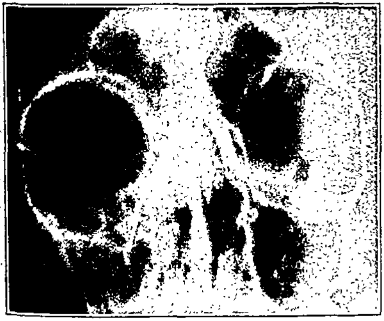
Intracranial or Cerebral Complications.

CASE 3.—A housewife, aged 41, had suffered from vague ill-health for about four years owing to a mild degree of cholecystitis. She was, however, otherwise normal. In May, 1929, two weeks before coming to the clinic, she developed a severe coryza, followed by a pain in the right side of the face. This only lasted a very short time, and the dull pain cleared up in a couple of days. A week afterwards she suddenly developed an acute fever with rigor at the onset, and an excruciating pain over the whole right face. Three days later she developed a feeling of extreme dizziness and a staggering gait and came to the clinic.

Examination showed localised supra-orbital tenderness, a right-sided nystagmus, the right pupil smaller than the left, and a staggering gait in some ways suggestive of a cerebellar lesion. The patient was suffering from acute spasms of pain. At first a tentative suggestion of "tic douloureux" was made. The nose was examined and was reported clinically negative. It was noted, however, that cocainisation of the nose relieved the headache to some extent. The leucocyte count was 6000. X ray examination of the skull and of the sinuses was done, and both antra were found to be completely obscured. The antra were washed out and large amounts of pus obtained. Antral windows were made for drainage. Relief was rapid, and a month later the patient was re-examined and seemed perfectly normal. Subsequently, in April, 1930, she was found to be suffering from recurrent but very mild headaches. The sinuses were X rayed again and were found to be perfectly clear.

Several interesting reports [8, 9] have been made on conditions which accurately simulate various types of mental disease but which appear to arise from and to be dependent on the presence of unsuspected antral infection. Such cases are very likely to be missed, and this is the more unfortunate in that cure results from effective treatment of the sinus condition. The ætiology is not understood but is presumably a local toxic effect. I have no very striking cases in my series, but Case 3 is illustrative of this process. Looper's report includes cases diagnosed as encephalitis, petit mal, narcolepsy, brain tumour, sudden coma, convulsions, and sudden delirium. In all of these complete resolution occurred after thorough treatment of diseased sinus conditions, which had been unsuspected until specifically looked for.

FIG. 1 (Case 2).



Generalised clouding of all the sinuses on the right side.

Cranial Complications.

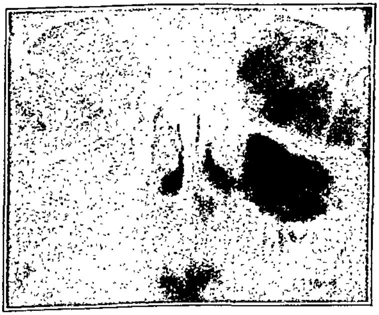
CASE 4.—The patient was a man of 44, normal to ordinary routine clinical examination. For 12 months he had been troubled with severe headaches practically every day. The pain occurred chiefly in the right eye, and over the right forehead and cheek. He stated that the pain was sufficiently severe to influence his mental activity; he felt himself to be duller than usual, and found it quite difficult to concentrate or to think. He gave a history of having had similar trouble three years before, which had been relieved by a dental extraction. He reported an occasional discharge from the right nostril, but the nose had been examined elsewhere and found normal. On clinical examination no causal lesion was found. On otolaryngological examination the nose was passed as normal; the tonsils were condemned as infected. The leucocyte count was 6300; the results of other laboratory examinations were insignificant. X ray examination showed marked clouding of the right antrum (Fig. 2). The antrum was punctured and washed, and frank pus was obtained. The patient was practically relieved of all his pain within a few days of the washing, and continued well as long as he was followed up.

The maxillary sinus is largely supplied by the second branch of the fifth cranial nerve through the spheno-palatine ganglion, and infective lesions within the sinus may originate referred pain in the other branches of, or the skin areas supplied by, the fifth nerve. This will result in headache or neuralgia, often of marked severity. The primary exciting factor is pressure, either the widely distributed pressure of a closed empyema or the more localised pressure produced by inflammatory exudate within the nerve sheaths supplying infected mucous membrane. The pain of the acute closed empyema is typical, and consists of an intense diurnal pain in the face and forehead, especially severe in the mornings, the face often being described as "feeling like bursting." Case 3, apart from its cerebral aspect, is a relatively typical example of an acute closed empyema of the antrum, the dominant symptom being pain. Case 4 is almost equally typical of a chronic closed empyema with tension. The mental dulling is of interest. It may have been secondary to the pain; it may also, however, have been evidence of intracranial toxic involvement, similar to the type described under group 3. The referred pain from the chronic lesions may, however, only affect a single branch of the trigeminal nerve, and show as infra-orbital or supra-orbital neuralgia, ear-ache, pain in the eye, frontal headache, or similar lesions. Sluder, in his book, describes such lesions under the title of spheno-palatine neurosis. It appears that such headaches may be excited as often from the antrum as from the sphenoids and ethmoids, as described by Sluder. In severe cases of lesions in this group, the pain may have all the characteristics of a "tic douloureux," the headaches those of severe migraine.[3, 10, 11]

Pulmonary Complications.

CASE 5.—A woman, aged 39, a housewife, gave a history of having suffered from "asthma" for three or four years, but before this she had been perfectly well. She gave no history of having had a severe cold at the time of onset of the disease, or any other suggestive history, but the onset had occurred a sufficient number of years before for details to have been easily forgotten. The asthma was constantly present, and had *not shown any seasonal variations.* About two years before she had had a tonsillectomy and a nasal operation (nature undiscovered), and had been improved for a period but not cured. The trouble as described by her was not of a paroxysmal nature but consisted of a chronic cough, productive of a moderate amount of mucopurulent expectoration, and a constantly "wheezing" type of respiration.

FIG. 2 (Case 4).



Clouding of the right maxillary antrum.

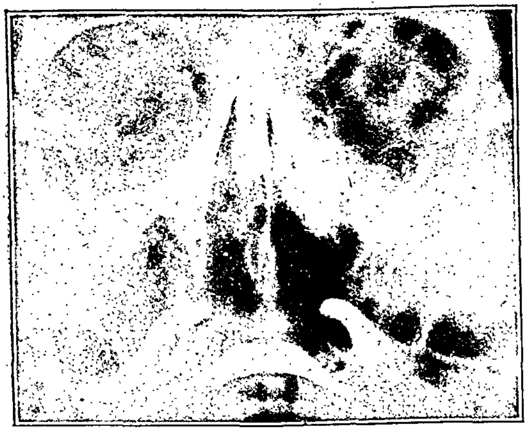
Otherwise she appeared clinically well, and nothing else was found on routine clinical examination. The white cell count was 8700. As a matter of routine, sinus radiograms were taken; these showed a markedly cloudy left antrum. The antrum was punctured and pus found. The antrum was washed out on four subsequent occasions, pus being obtained every time, but in very small quantity at the last examination. Following this course of antral lavage, the pulmonary condition became rapidly and spectacularly improved.

CASE 6.—A farmer, aged 20, complained of trouble with his throat and the bringing up of large quantities of sputum. He had had his tonsils removed when he was 8 and 12 years old. He had had this trouble for eight years—i.e., from the time of the second tonsillectomy. He always felt as if the throat was filled up, and he was unable to lie on his back without a severe paroxysm of coughing. During the paroxysms he reported that he was in the habit of bringing up large quantities of frothy sputum. Such an attack occurred while the patient was being examined; several cupfuls of highly purulent green sputum were coughed up. After such a cleaning-out he remained free of trouble for several hours.

On examination a severe chronic pharyngitis with considerable hypertrophy of the pharyngeal mucous membrane was noted. Considerable post-nasal dropping was also observed. The chest was radiographed after lipiodol injection, and an extensive bronchiectasis of the minor saccular type was found in the left base. The leucocyte count was 10,000. The sinuses were also X rayed, and clouding was found to be present in both antra (Fig. 3). These were punctured and washed, and pus was found in both. Bilateral "radical antrum" operations were done, and a great deal of degenerated membrane was scraped out. The patient was also put on conservative treatment for his bronchiectasis.

In many ways the most interesting of the secondary complications of sinus infections are those occurring in the respiratory system.[12–16] That there is a sound physiological basis for this has been demonstrated. On the one hand there is a very close inter-connexion of the lymphatic systems of the nose, the nasopharynx, and the thorax. On the other hand, it has been shown that foreign material or secretions from the nose and nasopharynx do find their way, often in sleep, into the bronchial tree. Mullin showed how Indian ink could be injected into the nasal lymphatics or into the sinuses and, later, particles discovered in the ultimate lymphatics of the bronchial tree. They also showed very similar results after the injection of tubercle bacilli. Quinn and Meyer, on the other hand, demonstrated that lipiodol left in the nose before going to sleep or dropped in during sleep passed into the bronchial tree in five out of 11 cases. It is thus easy to see how infection will carry from the sinuses deep into the lungs.

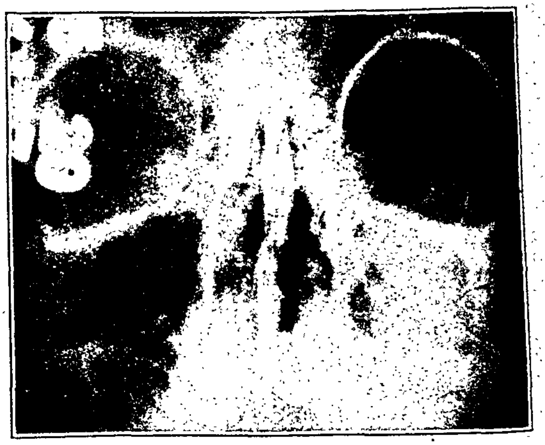
FIG. 3 (Case 6).



Clouding of both antra.

This relationship has also been shown statistically in studies of the ætiology of pulmonary disease both in the Army and in civil life. This fact has never been pointed out in the text-books—indeed, it was only first noted in 1916 by Rist and Sargent. Excluding tuberculosis or other specific pulmonary infections, a large percentage of pulmonary infections have a primary basis in a sinus lesion. So much is this the case that it has been said that investigation of the nasopharynx and of the nose should be a routine part of every chest examination. It has been found, too, that polypoidal conditions of the sinus membranes are as pathogenic in this respect as frankly purulent lesions. For this reason X ray examination is of particular value in this type of case. Kern and Schenck studied the sinuses in 200 cases of asthma both by X ray and clinical methods; they found a high incidence of sinus disease, and felt that, although both methods of examination were liable to considerable error, the X ray was of the two the more accurate. They also found that antral lavage is not an absolute criterion and that there are many chronically infected sinuses which do not show pus on washing. Brown has pointed out the frequency and importance of this type of thoracic complication in children.

FIG. 4 (Case 7).



Clouding of the left maxillary antrum.

The most common type of pulmonary infection is a chronic bronchitis productive of sputum and associated with a chronic cough. It is also found as true bronchiectasis, or passing under the diagnosis of "asthma." Case 5 is remarkably typical of reported cases. There was probably no extensive pathological basis within the bronchial tree, and the relief was rapid. If neglected, however, this type of case ultimately goes on to a definite bronchiectasis difficult to handle, such as is seen in Case 6.

In these cases the sinus lesion itself is practically always latent and painless, and very likely to pass unnoticed unless looked for. In one respect this group of lesions differs from those in the previous groups in that once they have become chronic, cure of the sinus lesion is not necessarily followed by resolution of the secondary lesion, although some amelioration of symptoms may occur. The lung lesion has to be treated independently. On the other hand, however, as long as the primary sinus focus remains present, no amount of treatment will relieve the thoracic complications for more than transient periods. For the same reason, prophylaxis is of the greatest value.

Miscellaneous.

CASE 7.—The patient was a young man, aged 22, apparently in perfect health. He came to the clinic on account of a peculiar painless swelling at the root of the nose over the glabella. This swelling was about 2 to 3 cm. in diameter, and raised about 1 cm.; it did not have the characteristics of an inflammatory swelling, was not tender, and was rather paler in colour than the surrounding skin. It felt doughy in consistency, rather like the œdema of a "white leg." The patient had had a "cold" some six to seven weeks before. On examination the interior of the nose was entirely normal; tumour and frontal bone periostitis were both considered as possible diagnoses. X ray examination of the skull suggested the presence of sinus clouding, and sinus rays showed definite clouding of the left maxillary antrum (Fig. 4). *The antrum was washed out and considerable pus obtained.* The sinus was washed periodically for the ensuing month. The swelling rapidly disappeared, and to date—one year later—has never recurred. It was presumably due to some peculiar form of local lymphatic obstruction.

While the majority of the lesions fall into the above groups as a natural result of the anatomy or physiology of the parts, yet there is also a small group of lesions which are difficult to classify. As a chronic infective focus an old-standing sinus lesion is always a possible cause for those diseases known to depend on the presence of toxic foci—the arthritides particularly. The sinuses should be as closely studied as teeth and tonsils in any cases where it is essential to eliminate "foci." Mithoefer[17] describes one interesting case of chronic colitis in which the disease disappeared almost immediately after effective treatment of a diseased sinus, the trouble presumably being due to and kept up by the constantly swallowed nasal discharge. Again, nephritis, especially in children, has been found to depend upon the presence of infected sinuses, and to fail to respond to treatment until the sinus had been attended to.

These conditions are illustrative of the possibilities rather than of special groups, and belong really to the interesting or curious findings of internal medicine. Case 7 is an illustration of just such an unexpected and anomalous finding. The types of complication described under the other groups are by contrast far from rare and far from anomalous, and their importance in the realm of internal medicine is still insufficiently realised.[18]

Summary and Conclusions.

Radiological examination of the accessory nasal sinuses often serves to draw attention to cases of antral infection. It may also disclose cases of latent empyema of the antrum, not otherwise discoverable. These cases are those in which the lesions complained of are secondary complications of an unsuspected sinus lesion. Such complications fall into five main groups. The orbital group includes an extensive series of reported cases of defects of vision and orbital complications of serious moment. The cranial group includes those producing headaches, facial pain, or neuralgia of various types. The cerebral group is an interesting group in which disease simulating mental disease is found to be entirely due to sinus infection. The thoracic group has been frequently described recently, and consists of those cases of non-specific pulmonary infection called chronic bronchitis, bronchiectasis, or asthma which are secondary to unsuspected sinus lesions. In addition there is a miscellaneous group in which distant lesions are unexpectedly found to depend on the presence of trouble within the sinuses. Illustrative cases are quoted.

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THE MEINICKE CLARIFICATION REACTION FOR SYPHILIS

IN MENTAL HOSPITAL PRACTICE.

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THIS paper records the results of parallel Wassermann and Meinicke tests made on 1000 sera forwarded to the Central Pathological Laboratory for routine examination.

Although the Wassermann reaction (W.R.) in the hands of the expert can be relied upon to give consistent and accurate results, it is generally accepted that wherever possible a parallel flocculation test should be made. In well-defined cases of syphilis there is fair agreement between most flocculation tests and the Wassermann reaction, but in treated cases this agreement does not occur, and the relative significance of the differing reactions will be discussed.

Michaelis,[1] in 1907, was the first to observe that precipitation occurred when a syphilitic serum was treated with organ extracts, and since that time numerous flocculation tests depending on this phenomenon have been described—e.g., Kahn, Sachs-Georgi, Sigma, Vernes, and Meinicke. Most of these have been reviewed in the League of Nations Report[2] on the sero-diagnosis of syphilis. The differences in technique depend mainly on the manner in which the organ extract is prepared, and the method by which the resulting flocculation, precipitation, and clarification is observed.

The Meinicke clarification reaction[3, 4] follows the Meinicke turbidity reaction; the organ extract is made from ox heart muscle, balsam of tolu is added to it, and the system is adjusted with alkali of varying strength till the isoelectric point of the colloidal suspension is approached, with the result that a positive reaction presents a clear-cut precipitation of the colloidal elements and clarification of the system.

The test can be set up in two forms:—

(*a*) The *macro-reaction*, a procedure which requires 0·7 c.cm. of serum and takes 16 to 20 hours to obtain a complete and quantitative reading; and

(*b*) The *micro-reaction*, which can be utilised where only small amounts of serum are available, as in pædiatric practice, in certain cases in mental hospitals, or where a rapid test is required. The reaction enables a result to be obtained within one hour.

It is claimed that hæmolytic, icteric, and cloudy

(*Continued from previous column.*)

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sera are all adaptable to the reaction, and further that a falsely positive result can never be produced by the admixture of blood or other contaminations with the sera.

Material and Method of Investigation.

The results reported here are taken from sera sent to the Central Pathological Laboratory of the London County Mental Hospitals for the routine W.R. test, and include a large number from cases of general paralysis both before and after treatment. The W.R. tests were made by the method adapted for mental hospital practice which has been used in this laboratory since 1910, and which is now accepted by the Royal Medico-Psychological Association as the standard method.[5]

The technique of the clarification test, as described by Meinicke,[3, 4] has been strictly followed, and the specially prepared and standardised "antigen" obtained from Meinicke's Serological Institute, Westphalia, has been used throughout the investigation; a four-tube test has been made on each specimen wherever the amount of serum permitted, failing that, in a few cases only the second and fourth tubes were used.

Some question had been raised as to the occurrence of non-specific reactions in cases of active pulmonary tuberculosis when tested by the older Meinicke turbidity reaction.[6] It was thought advisable, therefore, to examine the sera from such cases by the clarification reaction, and these results have been added.

On each specimen the W.R. and both Meinicke clarification tests were performed, and in the discussion of the main results the reading of the Wassermann is compared with the Meinicke macro-reaction. The results were read quite independently, and certain differences which occurred between the two Meinicke reactions will be discussed later.

In cases where the readings between the W.R. and Meinicke reaction differed inquiries were made into the histories of the patients to ascertain whether (1) there was any history of syphilitic infection, (2) there was any history of treatment for syphilis, (3) there were any clinical signs which might point to syphilitic infection in the absence of history. As a further aid, in a few of these cases it was possible to examine the cerebro-spinal fluid of the patient by the W.R.

Results.

An analysis of the first 1000 cases performed in this manner gives the following results.

1. *W.R. and Meinicke macro-test both negative (787 cases).*—These formed the greatest proportion of the cases, and amongst them were 13 known treated cases whose sera had become negative to both reactions.

2. *W.R. and Meinicke macro-test both positive (179 cases).*—The number of treated cases in this group was 87, and by far the greater proportion of these were general paralytics who had been treated by pyrexial methods (malaria or sulfosin), followed by some organic arsenic compound.

3. *W.R. negative and Meinicke macro-test positive (25 cases).*—Since this is the first group in which a difference between the two tests occurs, it is necessary to discuss it in a little more detail. Included in this number were 13 cases who had been treated for a syphilitic infection, and in whom the Meinicke reaction at the time of examination persisted as a positive, whilst the W.R. was negative. In general, positive reactions to flocculation and allied tests tend to persist longer in the treated cases than do the positive reactions to the Wassermann.

Of the remaining 12 cases, the histories and clinical signs, if any, were investigated.

One patient was a tabetic clinically, and examination of the cerebro-spinal fluid by the W.R. proved to be positive.

Another case also had clinical signs of tabes. The pupils were unequal and reacted very sluggishly to light. The knee- and ankle-jerks were absent, and there was loss of sensation to pin-prick over the forearms and legs. This patient died of pneumonia before an examination of the cerebro-spinal fluid could be made. Two other patients were senile, and had weakly positive reactions to the W.R. on the cerebro-spinal fluid. One other patient was said to have a "punched out" scar on the penis, and to have commenced having fits at a late age. One female patient suffered from corneal ulceration. She had had one miscarriage and 15 children, five of whom had died soon after birth or in the first year of life. In each of the latter cases the reaction of the cerebro-spinal fluid proved negative to the W.R.

The last patient to show any clinical signs was a man aged 48. The pupils were small, equal but irregular, and did not react to light. The knee-jerks were sluggish and the ankle-jerks could not be elicited. Bilateral extensor responses were present. There was no evidence of sphincter trouble. There was no history of syphilitic infection, and the cerebro-spinal fluid was negative to the Wassermann test.

In the remaining five cases both history and abnormal clinical signs were negative.

4. *W.R. positive and Meinicke macro-test negative (9 cases).*—Of this number seven were general paralytics who had been recently treated by malarial therapy followed by organic arsenic compounds. It is in this type of case that the Meinicke reaction appears to fail at times. The two other cases were also general paralytics, but no recent history of antisyphilitic treatment was given.

COMPARATIVE INTENSITY OF WASSERMANN AND MEINICKE REACTIONS.

The Table shows the *comparative intensity* of the W.R. and Meinicke reaction. The W.R. findings are quantitatively expressed in units of complement adsorbed per c.cm. of serum,[5] and the Meinicke results expressed according to the notation of intensity given by Meinicke in the description of the method[3, 4]—i.e., complete clarification in all the four tubes of the test, or, in the fourth tube only, representing a strongly positive reaction and noted ++++, and weaker reactions according to the clarification occurring in the first three tubes, the weakest being noted as + when clarification only occurs in the first tube.

Group.	W.R.	Meinicke.	Cases.	Group.	W.R.	Meinicke.	Cases.
1	+30+	++++	91	4	+10	++++	5
		+++	17			+++	8
						++	1
2	+30	++++	15	5	+7·5	+++	1
		+++	11	6	+6+	+++	2
						++	2
3	+15+	++++	9	7	Neg.	++++	6
		+++	16			+++	15
		+	1			++	4

It will be noted that a strongly positive W.R. is generally associated with a Meinicke reaction of similar intensity ++++ (Group 1), and that with a less marked W.R. (Group 2) the proportion of +++ Meinicke reactions greatly increases. This is also apparent in Groups 3, 4, 5, and 6, but in the majority of cases comprising these groups the W.R. of lesser intensity results from treatment, and it is evident that the Meinicke test shows a slower response to the effect of treatment. The cases in Group 7 also illustrate this finding: of the 25 cases noted, in 13 a negative W.R. followed treatment of previously positively reacting cases, with the Meinicke reaction remaining definitely positive.

In a recent report on the Meinicke test on 384 sera, by Prentice,[7] it was stated that the macro-test could be simplified by using only the last tube containing diluted serum, and that the reading of the first three tubes is unreliable. The results recorded above in no way support this statement, and it would appear that to make the test with one tube only seriously prejudices its accuracy, and certainly allows of no quantitative reading. Reference to the above Table will show that if a single tube test were adopted, approximately 40 per cent. of positive reactions would be missed. Moreover, the results recorded indicate that readings of the first three tubes are reliable, and have definite significance and support Meinicke's classification of strong and weak reactions. If the complete macro-test is carried out at varying periods after antisyphilitic treatment, it is possible to demonstrate quite clearly the weakening of the reaction in patients who are responding to treatment, as illustrated by the following case:—

Date.		W.R.		Meinicke.
July 25th, 1930	..	+10	....	+ + + +
Sept. 1st, „	..	Negative.	....	+ + +
„ 29th, „	..	„	....	+ +

MEINICKE MACRO- AND MICRO-TESTS COMPARED.

The micro-test was also made on all specimens recorded above. There was agreement between the macro- and micro-reactions, except in 12 cases in which the micro-test was positive, whereas both macro- Meinicke and W.R. tests were negative, and four cases in which the micro-test was negative where the macro- Meinicke reaction and W.R. were positive.

The positive micro-reactions of the first group were certainly of the weakly reacting type, but in the absence of confirmatory tests could not be ignored. They probably represent the pseudo-positive reactions referred to by Bousfield.[8] There appears to be no explanation for these false reactions other than the technical limitations of any drop method.

In the second group the variations arise from the fact that the micro- is a one dilution test, and if other dilutions were employed these few reactions might be found to be positive.

Altogether there is a fair agreement between the micro- and macro-reactions, but the few discrepancies noted indicate that the micro- is not so reliable as the macro-test, and should only be employed for reasons of urgency, and then should be confirmed by a subsequent macro-test, or in cases where it is only possible to obtain a few drops of blood.

THE MEINICKE TEST AND PULMONARY TUBERCULOSIS.

Specimens of serum from 30 active cases of pulmonary tuberculosis were examined. In 28 of these both W.R. and Meinicke reaction were negative. In one case both the W.R. and the Meinicke tests were positive, and in the other the W.R. was negative and the Meinicke positive. The latter case falls into Group 3 in the comparison of the main results, and amongst those in which no history or clinical evidence of syphilis could be found. In spite of this one apparently anomalous reaction out of the 30 cases examined, there does not appear to be any reason for believing that non-specific reactions occur in pulmonary tuberculosis.

Discussion.

The figures quoted show that the Meinicke macro- and the Wassermann reactions agree in 96·6 per cent. of the cases examined. It must be stated, however, that the high percentage of agreement bears some relation to the large number of negative results included in the series. If the 213 cases are considered in which a positive W.R. or Meinicke reaction was obtained, the results agreed in 84 per cent. of these cases. Of the 34 cases in which disagreement occurred among the 25 giving a negative W.R. 20 cases certainly had a definite syphilitic history; 13 of this number had previously given positive W.R.'s, which had disappeared under the influence of treatment.

Summarising these findings it will be noted that the majority of the instances of negative W.R.'s, associated with positive Meinicke tests, arose in syphilitic cases in whom the W.R. had been rendered negative by therapy. In only five cases could no specific history be obtained. The nine cases in which a positive W.R. was associated with a negative Meinicke test were clinically cases of general paralysis.

The above figures demonstrate that the macro-Meinicke clarification reaction has many advantages to offer as a parallel test in serological diagnosis by reason of the simplicity of procedure and general reliability. Unlike most flocculation tests for syphilis the reaction is clear-cut, and the end-point easy of interpretation. Fluctuations of temperature are more liable to affect the reaction in the first three tubes of the test than in the fourth, and where the heating arrangements of the laboratory are not operating throughout the night, the temperature of the room in which the tubes are placed may fall well below the optimum for the reaction (20° C.). To obviate this we found it necessary to place the racks containing the tests in an incubator set at 20° C. Meinicke stresses the importance of the temperature, and a short experience during the colder months served to emphasise this important point.

The results recorded indicate that a positive Meinicke in the presence of a negative W.R. may have some clinical significance, or in any case the positive Meinicke may persist in a treated case after the W.R. has become negative. It is, however, possible for a few negative Meinicke reactions to occur in definite syphilitic cases giving positive W.R.

The macro-test has proved more reliable than the micro-test, for whilst a specific case is rarely returned as negative, even when using one dilution with the micro-technique, pseudo-positive results may occur. In the macro-test wherein four tubes are used and larger amounts of the reagents are employed, no difficulty arises in reading clearly and correctly the result of the reaction.

Summary.

1. An analysis is made of 1000 parallel Wassermann and Meinicke clarification tests on sera from patients in the London County Mental Hospitals. An agreement has been found in 96·6 per cent. of the total.
2. Of the 34 cases showing a disagreement in the results of the two tests, 25 were negative to the W.R. and positive to the Meinicke test, and 9 showed a positive W.R. with negative Meinicke results. Of the former group, 13 had been treated for syphilitic conditions, 7 gave histories or signs of syphilitic infection, and in the remaining 5 cases no syphilitic history or clinical signs could be elicited. The latter group of nine cases were all confirmed clinically as general paralytics.
3. Evidence is produced to show that the Meinicke reaction tends to persist longer with the sera of treated cases than does the W.R.
4. The micro-test shows a 95·1 percentage agreement with the macro-test, but whilst representing a

useful rapid test where only minute quantities of blood are obtainable, it has not the same degree of reliability as the macro-technique.

5. The Meinicke macro-test is a useful parallel test to the Wassermann, especially in view of its simplicity of manipulation, clarity of results, and comparative freedom from non-specific positive reactions.

6. It is important to carry out the test in four tubes according to Meinicke's original technique, and the statement of Prentice that it can be made a one-tube test cannot be supported.

In conclusion, we would thank Dr. F. L. Golla, director of the laboratory, and Dr. S. A. Mann for their encouragement and advice in the course of this investigation.

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OCHRONOSIS.

REPORT OF A CASE WITH CARBOLURIA.

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This case was diagnosed clinically on the grounds laid down by Osler,[1] who was the first to recognise the condition during life in three cases associated with alcaptonuria.

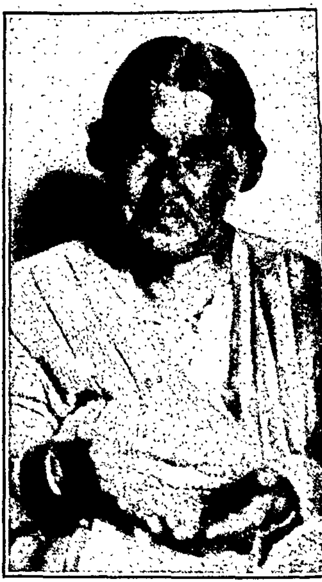
The patient, who was sensitive about her condition and reluctant to be the subject of investigation, was seen by one of us in 1927 when the diagnosis was made, but it was not until 1930 that she consented to help towards some of the results given in this paper.

Clinical History.

Condition in 1927.—Mrs. A., aged 59, complained of a progressive darkening of the skin of her face, which she thought had commenced about eight years before. The skin of her face was a uniform yellow-brown colour, except over the nasal cartilage, where it had a purple-blue tint. This gradually merged into the yellow-brown colour over the cheek in a butterfly-wing shaped area on each side. By standing well away from the patient, the observer gained from the purplish areas the impression of a butterfly's shadow over the face with the nasal cartilage forming the body; this, however, is not very well demonstrated in the photograph (Fig. 1). The sclerotics showed triangular symmetrical patches situated midway between the cornea and the canthus. The patches of pigment were deep to the conjunctiva, black in the centre and brown towards the margins, the four triangular areas being of approximately equal size and intensity of pigmentation. The base of each triangle was nearest to the corneo-sclerotic junction and the two sides ran nearly parallel with the margins of the lids. The ears presented the same peculiar purplish-blue pigmentation as that over the nasal cartilage, the concha being the most deeply stained. The aural cartilage was unduly rigid.

The hands showed a bluish tint on the skin over the thenar and hypothenar eminences, but there was no pigmentation of the nails. The flexor tendons at the wrist showed grey through the skin. The urine, when first seen, was yellow, contained a large amount of mucus and had a faint indefinable odour. The reaction was slightly acid to litmus and the specific gravity was 1016. Albumin was absent and Fehling's solution was not reduced but discoloured, Ferric chloride gave no blue colour. Microscopical examination of the deposit showed a few squamous epithelial cells and a few uric acid crystals. The urine on standing, darkened to a deep sepia tint within twelve hours but never became quite black. Decomposition did not occur on keeping for three days. On these grounds, the diagnosis of ochronosis was made.

FIG. 1.



Photograph showing pigmentation of face and hands.

Condition in 1930.—The patient was seen at various times during the years 1928, 1929, and 1930. On Jan. 23rd, 1930, she consented to physical examination. The examination revealed two large ulcers, one on each leg around and above the ankle. They completely encircled the leg and were about 10 cm. in width, the base of each consisting of unhealthy granulations. The skin at the edges was pigmented, but the pigmentation resembled that seen around old varicose ulcers rather than the characteristic tint of ochronosis. She now admitted the existence of the ulcers since she had had "white leg" in pregnancy forty years previously; they had been dressed with 5 per cent. carbolic acid lotion for a period of 35 years. This at once extended the investigation, since ochronosis has been recognised as being the outcome of alcaptonuria and also of the prolonged absorption of carbolic acid. With a view to ascertaining the true state of affairs, we proceeded to make a series of examinations on the urine—under certain difficulties, because the patient at that time was unwilling to be taken into hospital. On Oct. 13th, 1930, she was admitted to the General Hospital under Prof. W. H. Wynn, who gave us facilities for continuing our research and to whom we should like to express our thanks for his kindness. Daily samples of the urine were collected and dealt with in the manner set forth in the second part of the biochemical portion of this paper.

Condition in 1931.—The patient left hospital on Nov. 20th, 1930, the carbolic acid dressings being discontinued. No alteration in pigmentation of the skin, either in distribution or depth, was evident. The ulcers were healing with acriflavine dressings. She complained of backache and aching joints. Some arthritis was present in the back and knee-joints (? osteo-arthritis ochronotica). The urine was normal.

Chemical Investigation of the Urine.

PRE-HOSPITAL PERIOD.

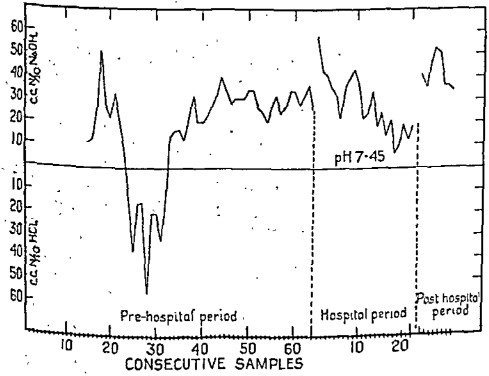
Between April and September, 1930, samples of the urine were obtained daily, but no data were available as to the time when it was passed or the diet taken. The urine was usually clear but contained for a period a large deposit of phosphates and mucus, coinciding with the period of alkalinity referred to later; the colour varied from the normal yellow to a smoky black. It usually darkened on keeping, this darkening process being greatly accelerated in alkaline solution. The darkening occurred at the surface and spread downwards, indicating an oxidative process. It was found by a series of experiments, using the Lovibond tintometer, that the darkening process was most rapid at pH 9·2.

Titratable acidity (on 90 samples) (Fig. 2).—The urine was usually acid, the titratable acidity varying from 10 c.cm. to 50 c.cm. N/10 NaOH per 100 c.cm. of urine, the mean value being 30 c.cm. N/10 NaOH per 100 c.cm. of urine. A *notable exception occurred with ten consecutive* samples which were on the alkaline side of the blood pH (7·45), varying from 14 c.cm. to 56 c.cm. N/10 HCl per 100 c.cm. of urine. This alkaline period was never repeated during the course of the investigation.

Sulphates (on 10 samples). The relative proportions of inorganic and ethereal sulphates varied only very slightly, the mean value for inorganic sulphate being 4 mg. SO_3 per 100 c.cm. urine, and for the ethereal sulphate 120·1 mg. per 100 c.cm.

Glycuronates (on 1 sample).—The glycuronic acid in one sample was estimated by Tollens' method[2] and found to be 77 mg. per 100 c.cm. of urine. This is three times the normal value as given by Tollens. The same sample of urine showed ethereal SO_3, 87·8 mg. and inorganic SO_3, 4·0 mg.; hence the ratio of glycuronolactone to ethereal SO_3 is 0·9 : 1. In normal urine, where the absolute amounts of glycuronolactone and of ethereal sulphate are very much smaller, Tollens[2] found the rates to be 2 : 1.

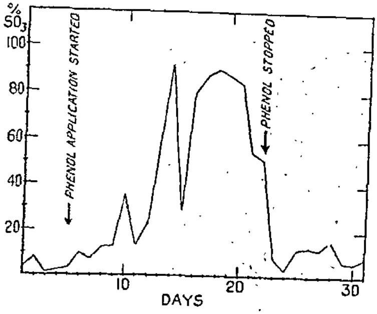
FIG. 2.



Titratable acidity curve. Consecutive daily samples, omitting week-end specimens.

Phenol.—The phenol was isolated as tribromophenol by distilling the urine with 5 per cent. hydrochloric acid (in later experiments with 5 per cent. sulphuric acid) and subsequently adding bromine to the distillate. The melting-point of the tribromophenol, once crystallised from 70 per cent. alcohol, was 87° C. No depression of the melting-point occurred in admixture with an *authentic specimen*. The amount of the bromo-compound obtained corresponded to 190 mg. of phenol per 100 c.cm. of urine. Probably the whole is present as sulphate and *glycuronate*.

FIG. 3.



Curve of urinary sulphate percentages. It should be noted that week-end specimens were not obtainable.

Homogentisic acid.—Repeated attempts to isolate homogentisic aid by the method of Garrod[3] were without success. The urine was heated to 90°C.; neutral lead acetate (5 g. per 100 c.cm.) was added and the solution was filtered hot. On cooling, a very small crystalline deposit (2·9 g. from 3500 c.cm. of urine) was obtained. The greater part of this proved to be lead chloride. The remainder after removal of the lead gave no colour with ferric chloride; did not reduce Fehling's solution; reduced ammoniacal silver very slightly, and did not progressively darken in potash solution—i.e., was not homogentisic acid.

Extraction of the Urine with Ether.—The urine was extracted in a "rocker" extractor with ether, and simultaneously the acidic extracts were absorbed from the ether either by N/10 NaOH or N/10 $Ba(OH)_2$, the former being the more satisfactory. The extraction was usually continued for four days. The alkaline solutions so obtained, which were usually black, were made acid to Congo paper with sulphuric acid and extracted with ether. The ether extract, after drying over calcium chloride, had the ether removed by distillation. The residue was then fractionated by vacuum distillation or vacuum sublimation or both.

(*a*) *Urine acidified with HCl.*—The ether extract distilled at 15 mm. yielded phenol, hydroquinone, and a little benzoic acid. Evidence for hydroquinone: the highest boiling fraction of the distillate (at 15 mm.) was crystalline. It crystallised from benzene in fine needles, M.P. 165–167°C. There was no depression in melting-point on admixture with an authentic specimen of hydroquinone (M.P. 168–169°). It immediately reduced ammoniacal silver nitrate and Fehling's solution and it turned dark in colour in alkaline solution. It gave no coloration with ferric chloride and on boiling with this reagent quinone was formed.

(*b*) *Urine acidified with sulphuric acid.*—The ether extract distilled and sublimed at 15 mm. gave phenol and much benzoic acid but no hydroquinone. A small quantity of substance, M.P. 120–174° C. (obviously impure), was also isolated. This unknown gave negative tests for hydroquinone. A black tar always remained after these distillations. The tar was soluble in sodium hydrate solution but not in sodium carbonate.

habit. The alimentary causes of chronic urticaria are of the nature of sensitisation, either specific (to a particular food) or non-specific sensitisation (to a great variety of foodstuffs, which variety is often not the same even from day to day). It may possibly be due to the absorption of toxic bodies or to the chemical changes in the blood which accompany constipation and consequent fermentation. The latter features, of course, are corrected by removing constipation. For the detection of sensitisation to specific foods, the method of skin tests offered great hope from the theoretical point of view, but has proved, in practice, of little value. Of more benefit is the keeping of a diary of the exact foodstuffs taken and the exact times of attacks of urticaria, when any correlation between the foodstuff and the urticaria is usually brought to light. If no such cause is found, it is not necessary or desirable to resort, with scant satisfaction, to some such vague but non-committal cause as focal sepsis, endocrine imbalance or biochemical derangement, in the absence of evidence, or to institute an interminable hunt for an elusive antigen.

It may be, and often is, true that some minor derangement of physical health or of mental equilibrium is permitting the persistence of a functional disorder which would disappear upon its correction, or it may be that the disorder of function has been allowed to persist for so long that now, in spite of good health, the habit continues. In the first instance, in the absence of a specific cause, we are called upon to restore the patient to normal health, and any disabilities discovered in the course of a reasonably careful clinical examination should be dealt with to this end. Examination of the urine should not be neglected; infected teeth should not be left in situ, in view of their possible secondary effects upon the general health; constipation should always be corrected; and habits of diet and meals should be put upon a normal basis. Undue nervous sensitiveness and particularly inadequate nervous rest, including sleep, should be inquired into, as should environmental factors, which may be exerting undesirable influences upon the physical or mental well-being. If such attention does not correct the disability, we should consider the possibility of bringing to an end the bad habit by sedative or shock measures. It should be borne in mind that urticaria is not uncommonly precipitated by an acute emotional upset or nervous shock and also that, being a highly sensitive vaso-motor nervous disorder, even if the acute precipitating cause has not been emotional, psychological factors will very readily step in as secondary provocative agents, once the reflex has been established. There is probably no group of skin affections or of medical disorders in which minor emotional disturbances play a greater part than in the production or persistence of chronic urticaria, and no case of chronic urticaria has received adequate consideration until this aspect has been reviewed.

Treatment.

The first measures instituted should obviously be eliminative, with a view to removing any possible poison emanating from the bowels and to correcting constipation. A great number of cases of chronic urticaria will clear as a result of these measures. In the second place, the general health and habits must be overhauled, any disorders found should be corrected and every effort should be made to see that the patient enjoys good and normal health. The dietary of the patient should next be reviewed, with a view to finding a possible cause in a specific foodstuff. If no specific cause is found, no useful purpose is served by dieting the patient stringently, on the contrary, full and normal diet should be taken. Too often one sees patients suffering from chronic urticaria in a state of starvation, and the restoration of normal diet does much to bring about recovery. Having conducted these preliminary investigations and corrections, the most important features in treatment are the internal measures prescribed. They fall into two groups: (1) measures of desensitisation and shock therapy; (2) measures directed towards the relief of nervous or emotional instability.

MEASURES OF DESENSITISATION.

If a specific protein is found to be the cause of the urticaria, the line of treatment is to exclude it from the dietary, or to endeavour to desensitise the patient by repeated ingestion or injection of small quantities of the offending substance. More commonly, no one specific foodstuff is found to be the cause. To deal with a general sensitisation to foodstuffs, the patient may be given a miniature meal one hour before the proper meal and of similar composition. This, however, is not a very practicable procedure and the same end is achieved by giving peptone, usually 0·5 to 1 g., one hour before meals. This is one of the most valuable measures in the treatment of chronic urticaria.

General desensitisation may be achieved in the same way by: (1) the intravenous injection of peptone once or twice daily, for a short period—5 c.cm. of a 5 per cent. solution usually being employed; or (2) the use of vaccines—e.g., T.A.B.; or (3) auto-hæmotherapy—the injection of 10–20 c.cm. of the patient's whole blood, taken from a vein at the elbow and immediately reinjected into the muscles of the buttock. Of all the measures demanding the use of the needle, auto-hæmotherapy is by far the simplest and often gives good results.

In this same class of treatment may be mentioned the administration of sodium hyposulphite, which may be given by mouth, or, more effectively, intravenously. This measure, which probably acts by its influence on the tissue cells, is more uncertain in its effect than the measures previously enumerated.

SEDATIVE MEASURES.

These provide the second line of attack upon chronic cases of urticaria. If, as is often the case, nervous influences are obviously playing the major part in the case, then this line of treatment will be adopted from the start. Its rationale presumes that hyper-excitability of the central nervous system is responsible for the exaggerated functional reactions, of which urticaria is the evidence. The most valuable measure here is probably potassium bromide, which is best given with sal volatile and nux vomica, as in the following prescription from the London Hospital Pharmacopœia: Pot. brom. grs. 10, sp. ammon. arom. ♏ 15, tinct. nucis. vom. ♏ 4, infus. gent. ad. oz. ½ t.d.s. p.c. Luminal in small doses—gr. ¼, or gr. ½—is exceedingly valuable. Valerian, phenacetin, and antipyrin are likewise of value, but are rarely as efficacious as bromides and luminal. It is quite hopeless to practise this line of treatment in a half-hearted fashion. If the diagnosis of the cause of a case of urticaria is correctly attributed to nervous influences the results of bromide or luminal therapy will probably be dramatic but will serve no good purpose at all if the treatment is stopped as soon as the symptoms are relieved. By means of sedatives one restores to normal a disturbance of function which has established a bad habit. It is also wise to take the patient gradually and not suddenly off sedatives used in this manner.

Another weapon of the same class, acting locally and not centrally, is superficial X ray therapy. A small application of X rays to the skin will restore normal function for a period and a few small applications, repeated at long intervals, will tend to restore normal function in much the same way as the administration of sedatives internally. Its great disadvantage in the treatment of urticaria lies in the fact that X ray administration to the whole of the surface of the body is a tedious procedure and is accompanied by a certain amount of temporary constitutional shock and depression.

TREATMENT OF CHRONIC PAPULAR URTICARIA OF CHILDREN.

This variety of urticaria, which is almost confined to children between the ages of one and three or four years, is probably dependent upon the two factors stressed—namely, a constitutional nervous sensitiveness and sensitisation of the skin to irritants gaining access by way of the alimentary canal.

Treatment should be directed, in the first place, towards correcting possible alimentary disorders and, if unsuccessful, should be combined with treatment of the nervous factor. In infants hyd. cum. cret., and in older children a mixture of rhubarb, magnesia, and bicarbonate of soda, will correct the disorder in the majority of cases. Most of those cases which resist such measures will be corrected by the simple addition of potassium bromide grs. 4 or grs. 5 t.d.s.

Local measures in the treatment of chronic urticaria of adults or children can afford no more than a measure of relief of the subjective symptoms and can do nothing towards curing the condition. Warm baths—often with the addition of bran—are comforting. Calamine lotion or liniment, with or without 1 per cent. carbolic acid, is usually sufficient by way of local application.

Urticaria should respond readily to treatment directed along correct lines. It does not serve any useful purpose to persist with a course of treatment in such chronic functional disorders unless favourable progress is apparent, for the cure of the disorder, if this eventually occurs, is more correctly attributed to time than to the treatment. In these circumstances the measures prescribed should be revised or withdrawn, for unnecessarily elaborate treatment sometimes encourages the persistence of such a disorder.

CLINICAL AND LABORATORY NOTES

ACUTE MONOCYTIC (HISTIOCYTIC) LEUKÆMIA.

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Reschad and Schilling-Torgau[1] described the first case of acute monocytic leukæmia in 1913. From that time to 1930 29 cases have been recorded, but Dameshek (1930)[2] reduced this number to 18, which included two cases described by himself. The reasons for his rejection of the other cases were that some were definitely myeloblastic leukæmia, others were of the acute myelocytic type, and some could not be differentiated from agranulocytosis. His rejection of these will be upheld by anyone reading the case reports.

THE PRESENT CASE.

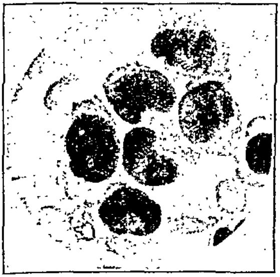
The patient was a boy, aged 19 years, a French polisher by trade, under the care of Dr. H. B. Lawrie, of Sabden, Lancashire. He was always healthy until August, 1930, when he was seen by Dr. Lawrie, but his family had noticed that he had looked pale for two months previously. When seen on Sept. 2nd he had had occasional rises of temperature—up to 100°F.—for the past three weeks, had become markedly paler, and had had some epistaxis and bleeding from the gums. The tonsils were large, and the gums swollen and granular. The spleen was enlarged, and extended 3 inches below the costal margin. The superficial glands were not enlarged, nor were there any petechial hæmorrhages. Blood examination on that date showed:—

Red cells	1,200,000	Polymorph	4 %
White cells ..	49,800	Lymphocytes ..	9 %
Hæmoglobin ..	22 %	Monocytes	87 %
Colour-index ..	0·9		

Thrombocytes very scanty. Monocytes all oxidase-negative.

The patient died on Sept. 12th. Autopsy was not allowed.

The "Type" Cell.—The normal monocyte of the blood stream was rarely seen in the films. The normal monocyte measures from 12 to 14 microns in diameter. The nucleus is large, varies in shape—rounded, indented, or horseshoe-shaped—and consists of a fine reticulum of chromatin. Nucleoli are not present. The cell is commonly oval, and sometimes presents cytoplasmic projections or pseudopodia. The cytoplasm stains a bluish-grey with Giemsa, and contains scattered azurophil granules. These cells are faintly oxidase-positive, the granules being very fine and scanty. The type cell of the present case differs from the normal monocyte in several important particulars. The cell is generally larger, measuring from 14 to 40 microns in the longest diameter. The nuclear structure appears even finer, and the shape of the nucleus shows more irregularity than in the monocyte. The nucleus is frequently folded upon itself and may show two or more folds. Nucleoli are not present. The cells take on innumerable shapes owing to the presence of pseudopods of different lengths and sizes (see Figure). The cytoplasm stains rather a lighter greyish-blue than that of the normal monocyte, and many of the cells contain very fine granules which are oxyphil and stain a reddish-pink with Giemsa, in contrast to the azure granules of the monocyte. The granules are often grouped round the nucleus. Furthermore, these cells are all definitely oxidase-negative. All stages from this cell to the normal monocyte may be traced in the films.



Six histiocytes described in the text. The folded nuclei and pseudopods are shown (× 1000). *Photomicrograph by W. E. Cooke and C. F. Hill.*

DISCUSSION.

The type cell in the above case was identical with the histiocyte (hæmohistioblast, clasmatocyte, or habit. The alimentary causes of chronic urticaria are of the nature of sensitisation, either specific (to a particular food) or non-specific sensitisation (to a great variety of foodstuffs, which variety is often not the same even from day to day). It may possibly be due to the absorption of toxic bodies or to the chemical changes in the blood which accompany constipation and consequent fermentation. The latter features, of course, are corrected by removing constipation. For the detection of sensitisation to specific foods, the method of skin tests offered great hope from the theoretical point of view, but has proved, in practice, of little value. Of more benefit is the keeping of a diary of the exact foodstuffs taken and the exact times of attacks of urticaria, when any correlation between the foodstuff and the urticaria is usually brought to light. If no such cause is found, it is not necessary or desirable to resort, with scant satisfaction, to some such vague but non-committal cause as focal sepsis, endocrine imbalance or biochemical derangement, in the absence of evidence, or to institute an interminable hunt for an elusive antigen.

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[1] Reschad, H., and Schilling-Torgau, V.: Münch. med. Woch., 1913, lx., 198.

[2] Dameshek, W.: Arch. Int. Med., 1930, xlvi., 718.

It may be, and often is, true that some minor derangement of physical health or of mental equilibrium is permitting the persistence of a functional disorder which would disappear upon its correction, or it may be that the disorder of function has been allowed to persist for so long that now, in spite of good health, the habit continues. In the first instance, in the absence of a specific cause, we are called upon to restore the patient to normal health, and any disabilities discovered in the course of a reasonably careful clinical examination should be dealt with to this end. Examination of the urine should not be neglected; infected teeth should not be left in situ, in view of their possible secondary effects upon the general health; constipation should always be corrected; and habits of diet and meals should be put upon a normal basis. Undue nervous sensitiveness and particularly inadequate nervous rest, including sleep, should be inquired into, as should environmental factors, which may be exerting undesirable influences upon the physical or mental well-being. If such attention does not correct the disability, we should consider the possibility of bringing to an end the bad habit by sedative or shock measures. It should be borne in mind that urticaria is not uncommonly precipitated by an acute emotional upset or nervous shock and also that, being a highly sensitive vaso-motor nervous disorder, even if the acute precipitating cause has not been emotional, psychological factors will very readily step in as secondary provocative agents, once the reflex has been established. There is probably no group of skin affections or of medical disorders in which minor emotional disturbances play a greater part than in the production or persistence of chronic urticaria, and no case of chronic urticaria has received adequate consideration until this aspect has been reviewed.

Treatment.

The first measures instituted should obviously be eliminative, with a view to removing any possible poison emanating from the bowels and to correcting constipation. A great number of cases of chronic urticaria will clear as a result of these measures. In the second place, the general health and habits must be overhauled, any disorders found should be corrected and every effort should be made to see that the patient enjoys good and normal health. The dietary of the patient should next be reviewed, with a view to finding a possible cause in a specific foodstuff. If no specific cause is found, no useful purpose is served by dieting the patient stringently, on the contrary, full and normal diet should be taken. Too often one sees patients suffering from chronic urticaria in a state of starvation, and the restoration of normal diet does much to bring about recovery. Having conducted these preliminary investigations and corrections, the most important features in treatment are the internal measures prescribed. They fall into two groups: (1) measures of desensitisation and shock therapy; (2) measures directed towards the relief of nervous or emotional instability.

MEASURES OF DESENSITISATION.

If a specific protein is found to be the cause of the urticaria, the line of treatment is to exclude it from the dietary, or to endeavour to desensitise the patient by repeated ingestion or injection of small quantities of the offending substance. More commonly, no one specific foodstuff is found to be the cause. To deal with a general sensitisation to foodstuffs, the patient may be given a miniature meal one hour before the proper meal and of similar composition. This, however, is not a very practicable procedure and the same end is achieved by giving peptone, usually 0·5 to 1 g., one hour before meals. This is one of the most valuable measures in the treatment of chronic urticaria.

General desensitisation may be achieved in the same way by: (1) the intravenous injection of peptone once or twice daily, for a short period—5 c.cm. of a 5 per cent. solution usually being employed; or (2) the use of vaccines—e.g., T.A.B.; or (3) auto-hæmotherapy—the injection of 10–20 c.cm. of the patient's whole blood, taken from a vein at the elbow and immediately reinjected into the muscles of the buttock. Of all the measures demanding the use of the needle, auto-hæmotherapy is by far the simplest and often gives good results.

In this same class of treatment may be mentioned the administration of sodium hyposulphite, which may be given by mouth, or, more effectively, intravenously. This measure, which probably acts by its influence on the tissue cells, is more uncertain in its effect than the measures previously enumerated.

SEDATIVE MEASURES.

These provide the second line of attack upon chronic cases of urticaria. If, as is often the case, nervous influences are obviously playing the major part in the case, then this line of treatment will be adopted from the start. Its rationale presumes that hyper-excitability of the central nervous system is responsible for the exaggerated functional reactions, of which urticaria is the evidence. The most valuable measure here is probably potassium bromide, which is best given with sal volatile and nux vomica, as in the following prescription from the London Hospital Pharmacopœia: Pot. brom. grs. 10, sp. ammon. arom. ♏ 15, tinct. nucis. vom. ♏ 4, infus. gent. ad. oz. ½ t.d.s. p.c. Luminal in small doses—gr. ¼, or gr. ½—is exceedingly valuable. Valerian, phenacetin, and antipyrin are likewise of value, but are rarely as efficacious as bromides and luminal. It is quite hopeless to practise this line of treatment in a half-hearted fashion. If the diagnosis of the cause of a case of urticaria is correctly attributed to nervous influences the results of bromide or luminal therapy will probably be dramatic but will serve no good purpose at all if the treatment is stopped as soon as the symptoms are relieved. By means of sedatives one restores to normal a disturb-works hard and is in perfect health, without symptoms of any kind.

The case is interesting because of (1) the gonococcal pyonephrosis; (2) the severity of the metastatic infection with slight and transient primary gonococcal lesion.

Gonococcal infections of the kidney are very rare. Although pyelitis is a fairly common complication of gonorrhœa, it is nearly always due to infection with other organisms of which the *Bacillus coli* is the commonest. In 1922 Simmons[1] found only 24 proven cases of gonococcal infection of the kidney in the literature, and of these only 15 were unmixed. In the other nine the associated organism was most often the *B. coli*. The onset varied from ten days to nine years after the original infection. Simmons described a case of his own in which a gonococcal pyonephrosis was found in a kidney which was ruptured by trauma. The original urethral infection was six months previous to the trauma, and there was evidence that the renal infection had been present for some time. He concluded that the infections were hæmatogenous, and that gonococci readily passed from the blood through the normal kidney without causing disease, but that if the kidney were already damaged, a gonococcal lesion might be produced. Support for this is given by Lavenant,[2] who in 1930 removed a kidney which was the seat of pyonephrosis. There was a mixed infection of staphylococci, *B. coli*, and gonococci; from the presence of a yellow abscess in the cortex, the route of infection was considered to be hæmatogenous. The condition had arisen after trauma, and had probably supervened on a hydronephrosis.

Similarly, le Fur[3] in 1904 found a gonococcal infection in a kidney previously the seat of closed aseptic hydronephrosis. There were no gonococci in the urine, nor was any cystitis present.

In the case reported here, although blood cultures were sterile, there is strong presumptive evidence of a gonococcal septicæmia, from the general condition of the patient and from the acute arthritis. That the kidney was previously damaged is probable in view of the rapid formation of an enormous pyonephrosis. It is unfortunate that no radiograms were taken at the onset, but the presence of large and dense calculi three months later argues their existence prior to the gonococcal infection. It is probable that a symptomless calculous hydronephrosis was complicated by the excretion of gonococci from the blood stream.

TOXIC EFFECTS OF INTRAVENOUS SALYRGAN.

By C. T. Andrews, M.D. Belf.,

RESIDENT MEDICAL OFFICER, HACKNEY HOSPITAL.

THE use of a complicated organic mercury compound in the treatment of heart failure dates from the introduction of novasurol as a diuretic by Saxl[1] in 1920. Some degree of mercurialism has been found to follow the use of this drug in 20 to 30 per cent. of cases, and novasurol as a diuretic has now been largely superseded by salyrgan, the use of which was first recorded by Bernheim[2] and Brunn[3] in 1924. Salyrgan is a white flocculent powder containing about 36 per cent. of mercury in combination with sodium-salicyl-allyl-amido-acetate. It is put up for injection in a 10 per cent. solution, and is given intramuscularly or intravenously in doses of ½ c.cm. to 2 c.cm. at about three-day intervals. It is usual to give ammonium chloride, in doses of grs. 20 to 30, thrice daily, at the same time.

The results so far recorded have been encouraging. Diuresis usually begins immediately after the first injection, and the total urinary secretion may rise to 100 oz. in the 24 hours. In a search of the literature I have not found any record of severe toxic symptoms following the use of this drug. Bedford[4] records 27 cases treated by salyrgan without toxic symptoms; Bernheim,[2] in 1000 injections, has not observed even slight toxic effects; other observers—Baker and O'Hare,[5] Brunn,[3] Herszky,[6] and Agnew[7]—have recorded similar results.

NOTES OF A CASE.

I have used the drug in nine cases of congestive heart disease. In eight of these a varying degree of diuresis was established. In one, toxic symptoms of such severity were produced that I have ventured to record the case.

A female patient, aged 22, was admitted to Hackney Hospital complaining of cough, shortness of breath, and swelling of the feet and legs of 12 months' duration. There was a history of rheumatic fever at seven. On examination she was found to be dyspnœic and slightly jaundiced. The heart-rate was 116, but the pulse was regular, and the blood pressure was 120/30. There was considerable cardiac enlargement, the apex-beat being in the sixth space in the anterior axillary line, and the right border 2 inches from the sternum. Double mitral disease and aortic reflux were found to be present. There were well-marked signs of pulmonary congestion. The liver was enlarged, the anterior edge being 3 inches below the costal margin. There was a moderate degree of ascites, well-marked œdema of feet and legs, and slight albuminuria.

Under digitalis therapy—ʒ iv. of the tincture in the first 24 hours, later reduced to ♏ xv. t.d.s.—the pulse-rate fell to 70 in three days, but after a week's further treatment with digitalis and saline diuretics, combined with restricted fluid and salt intake, the œdema had only slightly diminished.

Treatment with salyrgan was then begun. The technique used was that described by Bedford[4]; the dose was ½ c.cm. diluted to 10 c.cm. with sterile distilled water, and given into a vein at the bend of the elbow. The time taken for the injection was about four minutes. Before the full dose had been given the patient complained of headache. Fifteen minutes later she suddenly lost conciousness, and the upper limbs and face became involved in a clonic spasm of about 30 seconds' duration. The features became blanched during the seizure, the pulse became rapid and almost imperceptible, and the heart sounds during the attack were almost inaudible. The clonic spasm was followed by vomiting, which was repeated several times in the next hour.

In the 12 hours following the injection the patient had five similar seizures. Pallor was a marked feature of each; there was temporary loss of consciousness and each attack was followed by vomiting. No diuresis followed the injection; whereas the average daily output of urine for the four days preceding the injection was 33 oz., the average for the four days following was 24 oz. The blood-urea on the day following the seizures was 37 mg. per 100 c.cm. A urea-concentration test gave normal findings.

DISCUSSION.

I can state definitely that there is no possibility of an error having been made in the dilution of the salyrgan solution. The possibility of coincident uræmic manifestations is also definitely excluded by the blood-urea and the urea-concentration test. The marked tachycardia and pallor suggest a vaso-motor origin for the symptoms here described, and Jackson[8] has brought forward experimental evidence to show that the action of salyrgan extends to most, if not all, of the vascular structures of the body. We must assume that this patient possessed a marked degree of susceptibility to the drug, because the dose employed was much smaller than the average dose in general use. Possibly it would be advisable to test the susceptibility of the patient with a smaller dose than the ½ c.cm. generally employed. I now give three preliminary injections of ½, 1, and 2 c.cm. intramuscularly at three-day intervals, and then continue with 2 c.cm. intravenously if no reaction follows.

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[1] Simmons, R. R.: Jour. Urol., 1922, vii., 113.
[2] Lavenant, M. A.: Soc. des Chir., Paris, 1930, xxii., 406.
[3] le Fur, R.: Loc. cit.

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2. Bernheim, E.: Therap. d. Gegenw., 1924, lxv., 538.
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5. Baker, M. H., and O'Hare, J. P.: Jour. Amer. Med. Assoc., 1928 xci., 2060.
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MEDICAL SOCIETIES

ASSOCIATION OF AMERICAN PHYSICIANS.

THE forty-sixth annual meeting of this association was held at Atlantic City on May 5th and 6th under the presidency of Dr. RUFUS COLE (New York). One of the discussions was devoted to diseases of the blood.

Monocytic Leukæmia.

Dr. P. W. CLOUGH (Baltimore) read a paper in which he said that monocytic leukæmia, although rare, had excited interest because its demonstration would support the independent status of the monocytes. He had found reports of 16 cases which conformed to the criteria, and he now brought forward an additional case.* They had clinically resembled acute leukæmia of other types, and had been characterised by a marked relative and absolute increase in the number of monocytes in the circulation. In his own case, as in most of the others, there were many immature cells ("monoblasts"). The cells showed the finely reticulated nuclear structure typical of monocytes, a greyish-blue cytoplasm, and reddish-lilac granules which did not take an oxidase stain. Relatively large numbers of the cells showed phagocytic activity in stained films. At autopsy there was a very widespread leukæmic infiltration of the tissues with reticulum cells that exactly resembled the monocytes in the blood. This was particularly marked in the connective tissue around the vessels. There were also changes in the endothelium of the vascular spaces of the spleen, which had been regarded by some as evidence of hyperplasia and desquamation of these cells and of their development into monocytes. In many of the collected cases, said Dr. Clough, there had been some associated myelocytic hyperplasia—a finding which had led some hæmatologists to regard monocytic leukæmia as merely a variant of myeloid leukæmia. It seemed more reasonable to accept it as a distinct system disease, in which, however, there was often some associated disturbance and perverted activity of other parts of the hæmopoietic system.

Dr. G. R. MINOT (Boston) said: "We had about 12 cases of monocytic anæmia, and about four of them showed very definite symptoms of acute arthritis after the leukæmia developed." He asked if Dr. Clough's case or others recorded showed any arthritic manifestations.—Dr. CLOUGH replied that he did not think anything of the kind was noted.

AGRANULOCYTOSIS.

Dr. G. M. PIERSOL and Dr. R. STEINFOLD (Philadelphia) said that a classification of granulopenias was proposed as follows:—(*a*) *primary:* (1) acute (Schultz), and (2) chronic or recurrent. (*b*) *secondary,* due to general and focal infections, chemical causes, irradiation, and blood diseases. The occurrence of benign types, particularly those due to focal infections, was exemplified by several case reports. The mechanism of granulopenia had been studied experimentally in rabbits, by the inoculation of various bacteria which had been from time to time found in conjunction with the condition. The effect of altered states of reactivity had been considered, based on their resemblance to those cases associated with focal infection. Hyperergy and the Schwartzman phenomenon particularly were studied.

Dr. A. E. TAUSSIG (St. Louis) said that the number of cases of agranulocytosis now reported justified a first attempt to estimate the value of the various methods of treatment. Three methods only were of importance—namely, intravenous injections of small doses of neoarsphenamine, blood transfusion, and irradiation of the long bones with the X ray. An analysis of 340 cases showed a total mortality of 79 per cent. For the purpose of evaluating therapeutic procedures the cases which proved fatal within 48 hours of beginning treatment were discarded. This left 80 patients treated by means of irradiation of the long bones, with a mortality of 53 per cent.; 49 patients treated by means of transfusion, with a mortality of 69 per cent.; 31 who received neoarsphenamine, with a mortality of 77 per cent.; while of 172 patients who received other methods of treatment, 75 per cent. died. It seemed then that only irradiation and transfusion promised even reasonably satisfactory results. It would probably be wise to use both methods in the treatment of a severe case, and doubtless the results would be better the earlier the methods were applied. During the past 12 months, said Dr. Taussig, seven cases of agranulocytosis had been seen at the Jewish Hospital of St. Louis. Of these, two were moribund when admitted, and died the same day; a third received only symptomatic treatment, and also died. The remaining four were given stimulating doses of X rays over the long bones. Of these, two recovered, responding rapidly to the treatment and were discharged clinically well. The other two also responded promptly and satisfactorily to X ray treatment, the blood picture becoming normal, the fever and angina subsiding. After an interval of well-being, however, both cases relapsed, and in this relapse were refractory to X rays. Both died in coma.

In reply to a question, Dr. Taussig said that the object of treatment was to get an effect on the bone-marrow. The maximal amount of marrow, with the minimal amount of tissue over it, was in the long bones.

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* A further case reported by Dr. W. E. Cooke will be found on p. 129.—ED. L.

Hæmoglobin-production and the Liver.

Dr. G. H. WHIPPLE (Rochester, N.Y.) pointed out that hæmoglobin regeneration in experimental anæmia had received much attention during the last few years. The experiments of Robbins and Whipple were concerned with a simple anæmia due to withdrawal of blood.

This experimental anæmia in dogs was maintained at a given level—40–80 per cent. hæmoglobin or one-third of the normal hæmoglobin level. New hæmoglobin produced above this level was withdrawn and measured, thus keeping the anæmia level constant and evaluating the potency of any given diet for the production of hæmoglobin under these conditions. These dogs had been kept anæmic for years—in some cases seven years—and were in a state of perfect health and activity. The reaction to fixed diets was very constant, and repeated experiments in the early or late years of the anæmic period would show a similar hæmoglobin output. "With this base-line control for anæmic dogs," said Dr. Whipple, "we may record interesting differences in Eck fistula dogs, one continuously anæmic for six years." The Eck fistula dog was below the average normal for hæmoglobin production on various standard diet intakes. As was well known, when it was poisoned by chloroform, the liver was injured and the normal repair of this central necrosis might be very greatly delayed. Under certain conditions, therefore, the Eck fistula liver might approach a physiological insufficiency. Under favourable conditions, following chloroform poisoning of an Eck fistula dog, it had been observed that the output of hæmoglobin on standard diet intake might fall to a level about half that of the Eck fistula before the chloroform poisoning. In one case this condition was followed after eight months by a return of liver function to normal and a normal hæmoglobin output. This suggested that the liver takes an important part in hæmoglobin production. The liver perhaps helped in the grouping of amino-acids essential to the formation of parent pigment substances which were utilised by the bone-marrow to produce finished red cells. This observation was in harmony with the well-known fact that liver feeding enabled an animal or human to produce large amounts of new blood-cells. This helped to supply a logical explanation for success of liver diet in anæmia.

The Active Substance in Liver.

Dr. W. W. PALMER and Dr. R. WEST (New York) communicated a note in which "barium salts of acids derived from liver, highly active in pernicious anæmia," were described. From these, they said, a quinine salt had been isolated, and on hydrolysis, β-hydroxyglutamic acid and γ-hydroxyproline had been identified. More recently Dakin had isolated the quinine salt of a tribasic acid from liver, which contained the pyrrolidine ring, and had a higher melting-point and quinine content than those of acids previously reported. Injections of 700 mg. of this acid had given in two instances modest reticulocyte rises, up to 15 and 20 per cent., with red blood-cells at about one million. A crystalline substance had also been isolated from the regenerated barium salts, which was highly potent clinically.

Microcytic Anæmia in Middle-aged Women.

Dr. DOUGLAS VANDERHOOF (Richmond, Va.) reported five cases presenting a type of anæmia and certain clinical features suggesting a disease entity. The patients were all women, the youngest aged 37, and the oldest 46. The anæmia was chronic, having lasted from 11 years to 15 years in four cases, and at least two years in the other. There had been no remissions nor any symptoms or signs suggesting degeneration in the spinal cord. *Four of the* women showed the typical *tongue of atrophic* glossitis. Fractional gastric analysis showed achlorhydria in four cases, with no response after the hypodermic injection of 0·5 mg. histamine in three, while one patient showed a slight secretion of free hydrochloric acid after the histamine. In the fifth cases achlorhydria was strongly suspected, but the patient refused gastric analysis. All suffered from weakness, palpitation, and breathlessness, and four complained of digestive disturbances. Three listed diarrhœa of the morning type as a prominent symptom. All had menstrual irregularities with menorrhagia.

When these women first came under observation, the hæmoglobin ranged from 40 to 58 per cent. in four, with red cell counts from 3,200,000 to 3,900,000. In the fifth patient the hæmoglobin was 65 per cent. and the red count 4,200,000. All showed a low colour-index. The striking feature of the blood picture, however, was the small size of the red blood-cells. Their mean diameter was under seven microns in every case, ranging from 6·32 microns as a minimum, to 6·96 microns as a maximum. This blood picture, said Dr. Vanderhoof, might properly be classified as microcytic. It was of the hypochromic or chlorotic type, but the total red cell count tended to be lower than in true chlorosis, and the atrophic glossitis and gastric anacidity were distinguishing features in the cases reported. Treatment consisted of large doses of iron and adequate hydrochloric acid therapy. Instead of the iron an aqueous liver extract could be used with good results. The anæmia gradually recurred when treatment was omitted.

Dr. W. S. THAYER (Baltimore) pointed out that in severe chlorosis the blood count was usually reduced. In 1890–91 he had followed carefully 60 to 70 cases of chlorosis throughout their course. There was almost always considerable oligocythæmia, but the oligochromæmia was always relatively more marked. He thought that a normal red cell count with a very low hæmoglobin percentage was rare.

Iron in Anæmia.

Dr. G. R. MINOT and Dr. C. W. HEATH (Boston) gave a paper on the Response of the Reticulocytes to Iron, and Some Aspects of Iron Therapy. In pernicious anæmia without serious complications, treated with maximal amounts of liver or potent substitutes, the height of the reticulocyte rise, said Dr. Minot, was inversely proportional to the level of the red blood-cells and hæmoglobin before treatment. Similar, but less exact, relationships existed in anæmias responding to iron. Infections and other complications might hinder the action of iron, just as they hindered the action of potent material in pernicious anæmia. Distinct rises of reticulocytes occurred in response to iron with relatively high red blood-cell levels, at which in pernicious anæmia insignificant increases took place. With low hæmoglobin values the reticulocytes, in response to adequate treatment, increased much more in pernicious anæmia than in secondary anæmia. Both the hæmoglobin and red blood-cell level must be considered in evaluating the reticulocyte response to iron. For a given red blood-cell level the reticulocyte response to maximal doses of iron would be greater the lower the hæmoglobin, and the response for a given hæmoglobin level the lower the red cell count. Although in pernicious anæmia the distinctions were not so great, there was a tendency for the reticulocyte response at any given red blood-cell level or hæmoglobin level to be slightly greater in direct proportion to the colour-index. The exact type of case should also be considered in evaluating the reticulocyte response to iron. In cases with similar red blood-cell and hæmoglobin levels there was a tendency for those with achlorhydria to have reticulocyte responses to iron of less magnitude than cases with free hydrochloric acid in their gastric contents. There was, in general, a direct relationship between the height of the reticulocyte rise and increase of hæmoglobin; at least when before iron is given the hæmoglobin is less than 40 per cent.

REVIEWS AND NOTICES OF BOOKS

Modern Surgery.

Tenth edition. By John Chalmers Da Costa, M.D., LL.D., F.A.C.S. Assisted by Benjamin Lipschutz, M.D., F.A.C.S. London: W. B. Saunders Company. 1931. Pp. 1050. 45*s*.

This is the tenth edition of a work which has long established its worth. The great advantage of a text-book written by a single author resides in its uniformity of outlook. Although the assistance of Dr. Benjamin Lipschutz has been enlisted, the essential nature of Dr. Da Costa's book has been preserved. The two authors set themselves the task of true revision—that is, the inclusion of such of the new work as is worthy, the rejection of such of the old work as has proved faulty in conception and wanting in practice. They have avoided undue submission to fashion, while at the same time escaping from the trammels of ingrained habit and tradition. There is breadth of view and surgical judgment apparent in the teaching on almost any subject about which the reader may desire information. Modern ways of tackling old problems, such as Orr's method for osteomyelitis, or the Henderson operation for recurrent dislocation of the shoulder, are described and assessed, and the value of the descriptions is enhanced by the references to original sources of information. The practical nature of the work is exemplified by the discussion on injuries to tendons. Throughout the reader is encouraged to refer to recent work. This confidence in the judgment of the authors is likely to be consolidated by the candour and modesty of their remarks upon the operative treatment of exophthalmic goitre. This is a very good text-book of surgery, indeed a scholarly book, which could only have been written by men of culture, discernment, and experience.

Abdominal Pain.

By John Morley, Ch.M., F.R.C.S., Assistant Surgeon, Manchester Royal Infirmary; Surgeon, St. Mary's Hospitals, Manchester. Edinburgh: E. and S. Livingstone. 1931. Pp. 191. 10*s*. 6*d*.

In this book Mr. Morley attempts to give an explanation of the mechanism of distal and local pain in abdominal disease. His clinical observations have convinced him that Mackenzie's views are incorrect—i.e., that viscero-motor and viscero-cutaneous reflexes do not exist. He postulates a peritoneo-cutaneous radiation of pain and a peritoneo-motor reflex. There are numerous interesting clinical observations brought forward to support the hypothesis. Though the book is a very stimulating one to read it does not convince beyond doubt. There is definite experimental evidence of a viscero-motor reflex, and it is a little difficult to believe that in renal colic there is no such thing as a viscero-cutaneous radiation of pain. The whole subject is excessively difficult to elucidate, and we agree with the author that much investigation must necessarily be clinical in nature. The careful observations recorded here are a definite contribution to knowledge and provide an incentive to further study which will no doubt help to clear up this obscure branch of human physiology.

Clinical Examination and Surgical Diagnosis.

By Felix Lejars, Professeur de Clinique Chirurgicale à la Faculté de Médecine de Paris; Chirurgien de l'Hôpital St. Antoine. Translated by Helen C. Scott, M.R.C.S., L.R.C.P. London: Jonathan Cape. 1931. Pp. 872. 50*s*.

Chirurgische Diagnostik.

By A. J. Cemak. Vienna: J. F. Lehmanns. 1931. R.M.18.

Prof. Lejars's book in its French form is familiar to many surgeons. It has been most ably translated by Dr. Helen Scott, who has succeeded in conveying the meaning of the author and retaining the charm of his style. There is no other book quite like it in English. The student is taught the technical details of how to examine each region of the body as clearly as it is possible to teach him by the written word with the aid of pictures. The meaning of signs elicited is then discussed and the bearing of such findings upon the diagnosis. The whole plan of the book has been carried out extremely well, and no student can fail to learn much from reading it. His interest will be retained throughout. Though the illustrations, which reach the astonishing number of nearly 1100, serve their purpose in demonstrating the points that the author wishes to make, they have suffered in the reproduction, perhaps because the paper is not quite suitable or perhaps because so many impressions have already been taken from the original blocks.

"Chirurgische Diagnostik" is a new enlarged edition of a well-known atlas of surgical diagnosis. The chief change in it, beyond an increased number of illustrations, is the addition of many more tables of diagnosis, which are most useful for reference, though rather unsuitable for elementary students who are learning their work for the first time. Some coloured pictures appear in this edition which were absent from the former. The reproductions leave nothing to be desired in quality and there are 568 of them. Good as former editions were, this is better; it is more complete.

Calcium Metabolism and Calcium Therapy.

By Abraham Cantarow, M.D., Assistant Demonstrator of Medicine in the Jefferson Medical College, Philadelphia. Philadelphia: Lea and Febiger. 1931. Pp. 215. $3.75.

Lord Kelvin used to say that it is only when we learn to measure a thing that we really begin to know anything about it. Since it became possible to estimate accurately the blood calcium, we have begun to learn something of the mechanism of the calcium exchange in the body. Dr. Cantarow points out how progress in the knowledge of this subject has been made by investigators in physiology, chemistry, pharmacology, medicine, and experimental pathology. He makes it quite clear, however, that in spite of our increasing recognition of the importance of calcium in the economy of animals and plants, our knowledge of the physico-chemical regulations of inorganic salt metabolism is somewhat crude. The complexity of the mechanism of regulation of calcium metabolism renders the bulk of the literature on this subject incomprehensible to clinicians who have not been specially concerned with the subject.

Dr. Cantarow divides his book into three parts: normal calcium metabolism, abnormal calcium metabolism, and calcium therapy. In Part I. he deals with calcium absorption and excretion and the blood calcium. The factors involved in the maintenance of the normal serum calcium level are discussed in a separate chapter. He goes with considerable detail into the functions of calcium in the body. In this section he includes bone formation, membrane permeability, cardiac action, coagulation of blood and milk, nerve and muscle excitability, capillary permeability, acid base equilibrium, and water balance. In Part II. disorders of calcium metabolism are set out in detail. Rickets being too big a subject to discuss fully, Dr. Cantarow concerns himself very little with morbid anatomy, but he recognises that biochemical investigations have served to emphasise the truth of the original claims of Pommer and Schmorl as to the essential identity of rickets and osteomalacia. Hypoparathyroidism is discussed, and hyperparathyroidism is described in detail, though no space has been found for outlining the morbid anatomy and histology of generalised osteitis fibrosa. In a chapter on the disturbances of the level of the blood calcium and calcium partition the author describes the conditions under which hypocalcæmia is found, and some of the conditions associated with hypercalcæmia. Gastric tetany, phosphate tetany, and the tetany associated with hyperpnœa and with excessive dosage of bicarbonate are clearly set out. In Part III. the use of calcium salts by oral, subcutaneous, intramuscular, and intravenous administration is related in detail. The effects of the parathyroid hormone, of vitamin D, and of ammonium chloride on calcium metabolism are all described. Then follow a chapter on the treatment of tetany, and a last chapter on non-specific calcium therapy. The treatment of rickets and osteomalacia is not considered.

The book is well and concisely written, and almost entirely free from misprints. An excellent bibliography is appended. The author has succeeded in placing in an accurate and readily available form the whole of the useful knowledge on a new and important subject.

The Slum: Its Story and Solution.

By Harry Barnes, F.R.I.B.A., F.S.I. London: P. S. King and Son, Limited. 1931. Pp. 398. 18s.

Major Barnes knows a great deal about housing, both historically and as a contemporary problem. In this book he traces the three main channels along which legislative effort has flowed: the building Acts, deriving from Lord Shaftesbury; the reconditioning Acts, of which Torrens was the pioneer; and the Acts for slum clearance, whose first parent was Sir Richard Cross. Major Barnes gives impressionistic sketches of these and other champions of housing reform. He also supplies some interesting examples of time-lag; he tells us, for instance, that Joseph Chamberlain suggested in 1885 the "willing seller and willing buyer" formula for compulsory purchase, which was at last incorporated in the Acquisition of Land Act of 1919. With regard to present-day housing efforts, Major Barnes argues that we are not likely to make satisfactory progress so long as initiative is left to a large number of local authorities. He wants to see housing commissioners working on a large scale all over the country. It is a plea worth careful consideration. Major Barnes also thinks that in London and other great cities there is no practicable alternative to rehousing in high buildings. Not sufficient is said about the reconditioning of houses, of which a great deal more might be done with advantage at the present time. And the author's treatment of the pig-and-sty question is quite inadequate. Major Barnes does, however, advocate management by skilled women workers on the Octavia Hill system. The book would have been better if the author had cut out a number of rhetorical and jocose passages.

Radiologische Praktika.

Vol. XVII. *Röntgendiagnostik der Gallenblase.* By Priv.-Doz. Dr. F. Eisler und Dr. G. Kopstein. Leipzig: Georg Thieme. 1931. Pp. 153. M.18.60.

This volume, one of a series intended to cover the whole field of practical radiology, furnishes a very complete review of the examination of the gall-bladder by means of X rays. The authors trace first the history of this method of showing gall-stones, starting from Baxhaum's paper in 1898. A concise account of the anatomy and physiology of the biliary tract follows. In the main section on cholecystography the intravenous, oral, rectal, and intraduodenal methods of introducing the dye are carefully described, and the advantages and disadvantages of each method discussed. The authors themselves prefer the oral method and describe their own technique fully, giving due weight to that followed by other workers. The discussion of interpretation of results is full and clear. Special stress is laid on errors which may arise from variations in the shadow cast by a normal gall-bladder. Faulty projection may produce apparent variations in shape and can only be overcome by great care. The same cause is responsible for some cases where the gall-bladder is described as not filling, and where adhesions are diagnosed. To get the best results the patient must be rotated and films must be taken from different aspects and in different positions; sometimes an opaque meal must be taken before examination if clear-cut results are to be obtained. In our experience this precaution is especially desirable when the mobility of the gall-bladder is in question, since the excursion shown in relation to neighbouring viscera in different postures of the patient is the most reliable evidence of mobility. Hour-glass gall-bladder is fully discussed in all its aspects in this work, with particular reference to its pathological significance. To test the contractility of the gall-bladder the administration of egg yolk is advised, and the authors regard this as an essential part of every cholecystography; we ourselves find that toast with three or four pats of butter is as efficacious and more palatable to most patients. The egg yolk has the advantage, however, that it is more easily included in an opaque meal, if this is found necessary. The authors set out the evidence clearly and dispassionately, and while upholding their own views, do so very fairly and with consideration for those who differ from them. The book is well printed and the illustrations are numerous and well reproduced. The otherwise excellent bibliography is marred by the omission to link up authors named in the text with the corresponding papers quoted in the bibliography. The authors deserve congratulation on a comprehensive and useful monograph.

The Treatment of Behavior Disorders following Encephalitis.

An Experiment in Re-education. By EARL D. BOND, M.D., and KENNETH E. APPEL, M.D. New York: Commonwealth Fund Division of Publications. 1931. Pp. 163. $1.75.

SINCE 1919, when epidemic encephalitis became prominent, it has presented a problem which has perplexed all who have had to attempt to solve it. Teachers, judges, and probation officers, and those in charge of children's institutions, as well as parents, have been mystified when children after this disease suddenly became serious delinquents. The best efforts to handle the problem have been generally unsuccessful.

This book concerns a significant experiment in giving study and treatment to 62 children whose behaviour disorders were the direct result of encephalitis or resembled the effects of that disease. Gathered from homes and institutions where treatment in an adult environment had signally failed, these 62 children became members of a group under the observation and care of the Department for Mental and Nervous Diseases at the Pennsylvania Hospital. In this department the personality of each child is intensively studied; and, guided by the results of the study, attempts are made to develop in the children more wholesome attitudes to their illness and their environment, and to turn their unadaptive apache tendencies into useful, constructive behaviour. Nothing novel in the way of treatment is described. The necessity of having a long-distance plan is stressed, and this plan must be kept in view by all personnel dealing with the child. Such personnel includes psychiatrists, specially trained teachers, nurses, occupational therapists, and social workers. Probably the only criticism that can be offered against this most praiseworthy experiment is on the grounds of expense. Certainly in this country no local authority is likely to consider seriously "a graded school and playgrounds under psychiatric supervision, with a personnel including specially trained teachers, nurses, and occupational therapists" attached to "a hospital for mental diseases with a special building for children in its own grounds." But the methods employed, and the results obtained with this group of "apache" children, should be of considerable help to all concerned with children presenting conduct disorders after encephalitis; and they also throw light upon the treatment of other children whose behaviour is antisocial and perplexing.

A Manual of the Common Contagious Diseases.

By PHILIP MOEN STIMSON, A.B., M.D., Associate in Pediatrics, Cornell University Medical College; Attending Physician, Willard Parker Hospital. Philadelphia: Lea and Febiger. 1931. Pp. 351. $3.75.

THIS book has been prepared for the guidance of medical students, internes, and nurses, whilst the hope is expressed that it will be also of value to general practitioners, pædiatricians, and school physicians. It includes chapters on such subjects as the principles of contagion, serum reactions, and general management of contagious diseases, as well as on all the common infectious diseases except small-pox, the diagnosis of which is, however, dealt with under the differential diagnosis of chicken-pox. In connexion with each disease the rules for the quarantine of school and other contacts are detailed and specific methods of prophylaxis are described. With such a wide field to cover the author has been unable to maintain the balance of his book, and whilst in the chapter dealing with diphtheria such pareses as those of the oculo-motor muscles and the pharyngeal muscles are not mentioned, in the chapter on measles he has thought it necessary to devote two and a half pages to a discussion on the conflicting claims of Tunnicliff, Caronia and Sindoni, and Degkwitz for recognition of the ætiological significance of the various agents they describe. Some useful information may be derived from the sections dealing with the control of contacts of infectious diseases in schools, but since practice in this country seems to differ in several important details from that in the U.S.A., the value of these sections to British readers is somewhat impaired. The chapter on the general management of contagious diseases is concerned mainly with what is designated "medical aseptic technic," and is based on the ritual observed in the Willard Parker Hospital. The "Gown Technic" seems a miracle of completeness and must impose a continuous strain on the aseptic conscience of the nursing staff. Probably a simpler technique combined with attention to such factors as floor space and ventilation would absolve the author from recommending that "measles should be segregated at least on a separate floor, but preferably also in a separate building." Those with experience of chamber isolation wards in this country have had abundant proof that the spread of such diseases as chicken-pox and measles is amenable to that method of isolation. The two chapters on epidemic meningitis and poliomyelitis, in which the author has had the assistance of Dr. Josephine Neal, are the best part of the book. At the end of each chapter is a bibliography, in which we can find references to very little work published outside the United States. The general appearance and printing of the book is excellent, but the various points noted above, together with the fact that the phraseology is liberally interlarded with American idiom, are likely to prevent this work from becoming a serious rival to those already established in this country.

Indian Journal of Medical Research.

IN the April issue (Vol. XVIII., No. 4) R. N. Chopra and V. Iswariah contribute an article on their experimental investigation into the action of the venom of the Indian cobra. S. R. Christophers and I. M. Puri report on the results of their investigations of anopheline mosquitoes collected in Sierra Leone, while J. A. Sinton continues his series in a paper on the identification of *Phlebotomus purii*. An account of the rat-flea survey of Rangoon Port area, which will be read with interest by port sanitarians in particular and by those interested in plague in general, is given by G. G. Jolly, V. W. Fenn, and R. Doral. This account contains graphs and tables, and in their conclusions we note that *Rattus rattus* contributes only 8·83 per cent. to the rat population surveyed. The flea index for *Xenopsylla cheopis* is remarkably low at 0·14, while that of *Xenopsylla astia* is 2·59. C. A. Gill and R. B. Lal give a preliminary report on the epidemiology of cholera. Other papers include one by R. McCarrison, on goitre, and one by L. E. Napier on the feeding habits of sandflies.

of an insured patient's treatment in a rate-aided hospital or his treatment by a private doctor in a nursing home; the risk that remains to be covered is the cost of treatment in a voluntary hospital. Does actuarial information show this cost to be overwhelming when spread over the companies which so serenely encounter the other contingencies of insurance business in this country? As experience accumulates of the working of the compulsory system under Part II. of the Act the companies will doubtless be better able to state the terms on which such insurance can be made complete. At present, the hospitals can fairly contend, there is unfortunately a gap which must somehow be filled.

LATENT MAXILLARY SINUSITIS.

THE term "latent," as applied to any disease, is a relative one, and depends on the available means of examination and on the thoroughness with which they are employed. In the earlier days of rhinology it was used of any case of sinusitis which did not show the frank symptoms of local pain or unmistakable purulent discharge, even when swelling in the region of the middle meatus or a stream of pus could be discerned on expert examination of the nose. With our wider experience such cases can no longer be considered latent, but it has been recognised of recent years that cases of infection of the antrum and other nasal sinuses exist, and indeed are not uncommon, to which the term "latent" may more properly be applied. The symptomatology in these cases is usually that of some secondary complication such as asthma, migraine, retrobulbar neuritis, or the more distant symptoms of a focal infection. Many of the patients have no nasal discharge, except during exacerbations which are described as colds, and the nares look normal on examination. In some of these the antrum is dark, or relatively dull compared with the opposite side, on transillumination, and in many pus or other secretion can be obtained by tapping and washing out, or aspirating, the sinus. It is doubtful whether even these cases should be called latent, for transillumination and exploratory puncture are in everyday use by the rhinologist. But there is a further group of sinuses with chronically infected hyperplastic mucous membrane, or with polypoid degeneration of the lining, which may transmit light normally and from which the washing fluid may return quite clear. It is true that bacteriological examination will here show a growth of pathogenic organisms, but these cases may in the present state of our knowledge be fairly classed as "latent."

It is here that X ray examination has a special diagnostic value, and this is well brought out by Dr. RALSTON PATERSON in an article which appears on another page. Of 100 cases in which the antrum showed clouding on a routine examination, 46 were washed out and pus was obtained in 30, or 65 per cent.; bacteriological examination might well have disclosed a larger proportion of infection. In six of these purulent cases—i.e., in 13 per cent. of those washed out—the sinusitis was totally unsuspected before radiography and they are therefore classed by him as "absolute cases of latent sinusitis," but it is not stated whether any previous rhinological examination had been carried out. There is still a considerable percentage of error both in radiographic and clinical examination. R. A. KERN and H. P. SCHENK,[1] to whose investigations Dr. PATERSON refers, believed that this error was largely due to the rhinologist's reliance on the return of clear fluid on irrigation as an indication of a normal sinus; and certainly increasing experience shows that this is not an entirely reliable criterion without bacteriological examination of the fluid. As we mentioned nearly two years ago,[2] in commenting on their work, a further source of error is that former inflammation may leave a thickening of the muco-periosteum which gives a clouding both in the skiagram and on transillumination. Neither clinical nor radiographic examination is always reliable, but of the two, radiography is the more sensitive. Radiography, however, picks up evidence of past as well as of present disease; furthermore, it often fails to demonstrate recent acute infection, whereas by clinical examination chronic disease is more likely to be overlooked, especially a low-grade type of infection. Both clinical and radiographic methods should be employed in obscure cases, for a sinus cannot properly be regarded as healthy merely because it transilluminates brightly, or even because a clear fluid is returned on irrigation. With the more thorough and accurate methods of examination now at our disposal, fewer cases of sinusitis need be labelled "latent" because they have eluded diagnosis.

HEALTH IN INDUSTRY.

THE general acceptance of the fact that a healthy, contented worker is as necessary to productive efficiency as is well-designed and lubricated machinery is largely due to the activities of the Industrial Health Research Board, whose eleventh annual report has just appeared.[3] The progress made during the second quinquennium of the Board's existence is summarised. The advances recorded are not the less remarkable because they seem obvious when made and are rapidly becoming common knowledge. The ideal work curve, for example, is now recognised. This curve is that of a record-holding long-distance runner who quickly attains his optimum pace and then maintains it unaltered to the end; yet, but a few years ago the saddle-back shape of hourly output, in particular, and other irregular shapes, were claimed to represent normal physiological processes. The discovery of this law of human efficiency—entirely based on the researches of the Board—is to-day of great value in estimating the influence of various factors upon productivity. The value of such adjuvants to output as rest-pauses or improved lighting is measured by the extent to which any particular work curve is made to approximate to the ideal shape. No longer is ridicule poured upon the prophecy that by reducing hours of work output may be increased, in proportion to the extent that output depends mainly upon human activity. In fact the dictum now is that, except to meet some emergency, overtime does not pay; while some daily relaxation is appreciated to be advantageous to both health and efficiency. Accidents have been shown not to be inscrutable acts of blind chance, but to be subservient to definite influences, both intrinsic and extrinsic. Persons of nervous instability display a high accident-rate; 25 per cent. of such persons in any group are likely to be associated with 75 per cent. of the accidents. These unbalanced persons also tend to have a high sickness-rate, and to be the least skilled among the workers. Extrinsic factors are also important. Fewest accidents occur at a temperature of 65°–67° F., which is the optimum for output and for least lost time; the accident-rate is also affected by lighting, noise, and external irritations. In fact, the incidence of industrial accidents may be used to measure healthy or unhealthy industrial environment. Here, then, is another discovery—that, given the existence of a hazard, accidents are not "accidents."

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[1] Amer. Jour. Med. Sci., 1929, clxxviii., p. 168.

[2] THE LANCET, 1929, ii., 779.

[3] Eleventh Annual Report of the Industrial Health Research Board to June 30th, 1931. H.M. Stationery Office. 1931. 1s. 6d.

All research, however, has not been positive; certain ghosts have been laid. The effect of monotonous repetition work is one; it has often been claimed as a soul-destroying influence of modern mass production. Nowadays it is known that boredom is more intense in semi-automatic operations, which prevent freedom of thought, but are insufficient to keep the mind fully occupied; relief comes from more complete mechanisation, when the mind may wander. Nevertheless, the more intelligent workers prefer occupation which keeps both body and mind fully employed. Another bogy exposed is the harmful influence generally held to be exerted by menstruation on mental and muscular efficiency; the undue stress laid on this influence amounts often to an obsession. Research has failed to provide experimental evidence that the menstrual period in normal women is associated with serious incapacity; it rather indicates that no special strain is laid upon the organism by the performance of physical work at such times, and, since functional activity, as a whole, is lowered, that external work is performed at lower physiological cost. These findings are in accord with the survey reported in this journal last July,[4] which disclosed that certainly more than half a typical batch of schoolgirls have no pain or disability at all at a time when popular tradition pictures their lives as profoundly disturbed; while the association disclosed between active exercise and "no pain" recalls the advice given in the seventeenth century by RAMAZZINI to his fashionable patients who complained of dysmenorrhœa, to follow the customs of working women.

A final example of the negative results recorded by the workers of the Industrial Health Research Board is the refutation of the assertion, often made, that the conditions of so-called humid weaving sheds are less favourable than those of other sheds; here the most careful analysis of invalidity records has failed to supply any evidence in support of the contention. Many other features are summarised in the report, all of practical economic advantage to our industries. References are supplied to the original accounts of the investigations, and these deserve the attention of works-managers, as well as their medical advisers.

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[4] Menstruation in Schoolgirls, THE LANCET, 1930, ii., 57.

ANNOTATIONS

DETECTION OF BACTERIA IN MILK.

AN indictment of official methods of testing the bacteriological content of milk is made by Prof. James McIntosh and Dr. Lionel Whitby in our columns this week. As the outcome of investigations, extending over six years, on the milk supplied to the Middlesex Hospital, they criticise not only the standard technique of estimating bacterial content but the popular "holding" method of pasteurisation, and they emphasise the necessity for continuous as distinct from intermittent bacteriological control. Their contention is that on the whole the expensive high-grade products are outside the purse of the average hospital, and that for an institution the problem resolves itself into the purchase of milk of good average nutritional value. The examinations recorded in this article are mainly of samples of ordinary milk before and after pasteurisation, and of milk supplied to the hospital as pasteurised milk. In view of their bacterial findings on milk pasteurised by the "holding" method, they submit that the "flash" method is preferable. This view was formed after examination of samples sold to the hospitals as "pasteurised milk"—that is milk which under Milk (Special Designations) Order, should not contain more than 100,000 organisms per c.cm. During the warm weather, May to September, these samples have often been found to have a bacterial content of several millions. Furthermore, many millions of viable organisms per c.cm. were found in some samples of pasteurised milk sent to these authors for examination in the summer of 1928 by the M.O.H. of Islington. The results of the analyses "came as a bombshell" to the dairy company concerned, which is known to take great pains to supply the public with clean and wholesome milk. A very opportunity was given for confirmation and comparison of results, and eventually the discrepancies were traced to a difference in the technique of the examination, the Middlesex Hospital workers having used a richer medium than that recommended in the Circular issued by the Ministry of Health. The main thesis of their important communication is that a richer medium should be officially adopted for routine examination, since bacteria which resist the "holding" method of pasteurisation in common use may escape detection when cultures are made on the lemco-peptone agar at present recommended by the Ministry. The preference expressed for flash pasteurisation follows naturally on the smaller numbers of bacteria obtained from samples of milk thus pasteurised.

TUBERCULOUS BACILLÆMIA IN ACUTE RHEUMATISM.

For many years now in Vienna blood cultures for tubercle bacilli have been made by Prof. E. Loewenstein; the blood of at least 4000 cases has been examined, and from these experiments the following facts have emerged. In healthy persons tubercle bacilli have never been found, nor are they found in the blood of patients with carcinoma, sepsis, enteric fever, pneumonia, or venereal diseases. Tubercle bacilli can be found at times in the blood of all progressive forms of tuberculosis, especially during exacerbations. This is true not only of pulmonary tuberculosis but also of tuberculosis of the skin, larynx, kidney, and eye. For instance, in tuberculous skin lesions—tuberculides, Bazin's disease, lupus erythematoides, &c.—according to the latest reports positive blood cultures have been obtained in 51 of 92 cases (55 per cent.);[1] the figures available when we last commented on this work (see The Lancet, May 23rd, 1931, p. 1147) were 41 positives out of 66 cultures made in cases of tuberculous skin lesion—that is, 62 per cent. Another important fact that emerges is that tubercle bacilli seem to be found with a very considerable frequency in diseases which till now were not commonly regarded as tuberculous in origin. In so-called acute rheumatic polyarthritis positive blood cultures have recently been obtained in at least 24 cases; within the short space of four months seven young women was admitted to one clinic in Vienna with typical rheumatic joint and cardiac lesions, showing tubercle bacilli in the blood, in some cases cultured on several occasions.[2] In children with acute rheumatism, pure cultures of tubercle bacilli, pathogenic to rabbits, fowls, and guinea-pigs, were frequently obtained. And now[3] Loewenstein describes his success in obtaining four positive blood cultures from cases of chorea; 17 positive blood cultures from 40 cases of disseminated sclerosis; in cases of retrobulbar neuritis 4 out of 6 cultures made were positive, and in cases of schizophrenia 9 out of 24. It is admitted that 7 of the 17 cases of disseminated sclerosis had signs of pulmonary disease, and one case at autopsy showed obvious pulmonary tuberculosis. This resemblance between rheumatism and tuberculosis has long been a matter of comment. Poncet, in 1909, described cases of tuberculous rheumatism, and many suggestive cases have since been published, especially in France. A short description of this relationship, with references, can be found in Recent Advances in the Study of Rheumatism (London, 1930), although the authors do not mention Loewenstein's work. Another curious link between acute rheumatism and tuberculosis is in connexion with the disputed ætiology of erythema nodosum. Loewenstein has shown that in tuberculosis positive cultures are found in the spring rather than in the autumn and winter. Forty patients with skin tuberculosis, in whom blood cultures were made every two to three months, were followed up for a period of one and a half years. A few were persistently positive, but the majority became negative in autumn and winter, only to relapse in the following spring. Is the seasonal incidence of rheumatism and chorea to be explained on similar lines? Are the exacerbations and recrudescences to be attributed to a tuberculous bacillæmia? Although tubercle bacilli have been cultured from the blood in cases of so-called rheumatic arthritis, morbid anatomy and histology do not support the view that tuberculosis is the pathological basis of a polyarthritis or carditis. Tuberculosis, especially of a severe degree, has always been rife in Vienna, although it must be noted that in the cases of skin tuberculosis the blood for Loewenstein's investigations was taken from patients all over Europe, in cities as far apart as Hamburg, Bergen, and Copenhagen. A curious feature of Loewenstein's rheumatic cases with a positive blood culture was that the Pirquet and Mantoux tests were frequently negative, although, according to many authorities, a tuberculous bacillæmia is necessary for the establishment of allergy to tuberculosis. Loewenstein's work does not depend merely on the demonstration of stained tubercle bacilli, but on their actual culture from the blood, and since his technique is apparently not difficult, it is highly desirable that his work should be repeated in this country.

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[1] Loewenstein, E.: Münch. med. Woch., 1930, lxxvii., 1662.
[2] Reitter, Carl, and Loewenstein: Ibid., 1930, lxxvii., 1552.
[3] Loewenstein: Ibid., June 26th, 1931, p. 1080.

CLIMATOLOGY IN MEDICINE.

The medicine of a hundred years ago made use of remedies very like those of the present day—namely, drugs, diet, and environmental and physical influences such as climate and baths. With intensive use of the experimental method has come a better understanding of the effect of drugs and diet, and besides leading to the discovery of new remedies this has shown the correct application of old ones, so that results can now be predicted which were previously uncertain. So far from disproving the efficacy of the older forms of treatment, however, modern experiment has usually served rather to show their true basis while at the same time defining their purpose and limitations.

With the advent of this new knowledge of diet and drugs, climatic therapy has fallen somewhat into the background. Despite countless observations on many of the factors at work—such as air temperature and moisture—there is as yet little correlation of these data with physiological reactions, and there are probably many factors involved which are at present imperfectly understood. In Germany climatic and spa treatment has always taken a relatively important place, and the movement towards their scientific study has lately been conspicuous there. The many papers appearing in the German medical press this year show clearly, however, that climatic therapy is still mainly in the empirical stage. The difficulty of adapting the experimental method, as A. Loewy[1] points out, is the large number of variables not under direct control as in laboratory conditions. Then again the climatic conditions regarded as typical of a certain locality are constantly being upset by temporary weather effects. Thus sea air increases the respiratory exchange and the metabolic rate,[2] but a person residing on the coast is only thus influenced, it is said, as long as the sea wind is blowing. Again, heat loss depends not merely on air temperature, but also on ground temperature and wind speed. Thus localities where the cooling values, as estimated instrumentally, are similar, may have widely different climatic conditions. The most definitely known effects at present, apart from ultra-violet radiation, are those of high altitudes, where oxygen-lack stimulates respiration, increases hæmoglobin, and raises the blood pressure. Sea air also has a stimulating effect, and there are indications that the particulate matter especially present in the air of low-lying inland places may be of importance by virtue of its chemical nature or electrical charge. In this as in other branches of medicine much is known, but little is yet applicable to practical therapeutics. In addition to studying the types of climate there should be a more determined attempt to assess the results of treatment of certain diseases under different climatic conditions. This experiment would have to be done on a large scale if the results were to be of any value, but there is at least a big field open here for those who have the necessary opportunities.

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[1] Deut. med. Woch., May 6th, 1931, p. 789.
[2] Münch. med. Woch., April 3rd, 1931, p. 566.

RECENT WORK ON DIPHTHERIA.

THE May issue of *Annales de Médecine,* which has lately reached us, contains 13 papers, from eight different countries, on the epidemiological, bacteriological, and clinical aspects of diphtheria. In a short note on experience in Paris during the last five years Émile Roux points out that though cases of malignant diphtheria have been more numerous in France, as in other European countries, since 1926, in Paris the case mortality during this period has been comparatively low, and there has been no increase in the incidence of the disease. He emphasises the importance of early administration of antitoxin, which, he maintains, it is a mistake to regard as curative, its action being merely to prevent the spread of intoxication. J. von Bokay gives a short history of diphtheria at Budapest since 1884, when the disease was first made notifiable, and draws attention to the increased severity and prevalence of faucial attacks, whereas there has been a considerable fall in the incidence of laryngeal cases. In a biological and immunological study R. Debré, G. Ramon, and P. L. Thiroloix come to the conclusion that the severe forms of diphtheria, especially those which end fatally, are produced by organisms with a remarkably high pathogenic power, although they admit that individual resistance, as determined by estimation of the antitoxin in the blood, must also be considered. In their paper on the general character of diphtheria in the French army since the war, C. Dopter and Collignon show that diphtheria has increased during this period in the army, as in the civilian population, especially in certain garrisons. Systematic active immunisation, however, has had such an excellent effect in reducing the incidence that a Bill is being prepared to make this practice compulsory, as has been done in the case of inoculation against typhoid fever. In a paper on latent infection in diphtheria, U. Friedemann, of Berlin, maintains that the influence of latent immunisation on the incidence of diphtheria is greater for diphtheria than for scarlet fever, but less than for poliomyelitis, diphtheria being an endemic disease in all civilised countries, in contrast with poliomyelitis, which is essentially an epidemic disease. E. Gorter describes a severe epidemic at Leyden, in 1930, characterised by a predominance of toxic cases and an unusual frequency of subsequent paralysis. Prof. and Madame Hirszfeld, of Warsaw, discuss the constitutional basis of the Schick reaction, and refer to their researches showing that if both parents have a positive reaction the reaction is almost always positive in their children, while if the parents have a negative reaction, two-thirds of the children are negative and one-third positive, and, lastly, if one parent is positive and the other negative 56 per cent. of the children are positive.

P. Lereboullet, J. J. Gournay, and J. Donato, who discuss the renal function in diphtheria with a record of eight illustrative cases, come to the conclusion that renal involvement, as shown by hyperazotæmia and albuminuria, does take place in diphtheria, but that clinical, anatomical, and experimental evidence does not favour the view that this involvement is so serious as in scarlet fever, and, in any case, it is much less important than affection of the heart, suprarenals, and central nervous system.

In an article on the serum treatment of diphtheria, Ramon and Debré hold that the charges of inadequacy brought against diphtheria antitoxin in the recent severe outbreak of diphtheria on the Continent are not justified, and incriminate the malignancy of the attack, delay in administration of antitoxin, and association with other infections, as responsible for its apparent failure. They add that the generalisation of active immunisation by anatoxin is the only certain method of protection against diphtheria. H. Roger, C. Mattei, and J. Paillas, who have collected 70 cases of paralysis of the brachial plexus following serum treatment of any kind, emphasise the rarity of this sequel, especially in the case of diphtheria antitoxin, of which only nine examples have been recorded, in contrast with 40 following injection of tetanus antitoxin. Bela Schick and Anne Topper, of New York, confirm their previous observations, showing that tonsillectomy and adenoidectomy tend to convert a positive Schick reaction into a negative one, and thus increase immunity to diphtheria. They suggest that children with diseased tonsils, who are hypersensitive to horse serum, should have them removed, and that children who have undergone tonsillectomy within the last six months should be Schick-tested before being immunised by toxin-antitoxin, or anatoxin. S. Schmidt, of the Danish Serological Institute, deals with the affinity between toxins and their specific antitoxins. The history of diphtheria in Berlin is narrated by E. Seligmann, who deals especially with the remarkable recent increase in its severity, the case mortality having risen from 5·8 per cent. in 1924 to 11 per cent. in 1927, and being almost as high in school-children as in younger patients. Like the other writers, he insists on the value and harmlessness of active immunisation.

EPHEDRINE.

THE purpose of the series called "Medicine Monographs" is to provide, in convenient and readable form, critical digests of recent views on various aspects of medicine. Volume XVII. on "Ephedrine and Related Substances"[1] adequately fulfils that purpose. The teacher and clinician will welcome a succinct account of the history, pharmacognosy, and chemistry of the genus ephedra, and the pharmacological action and therapeutic uses of ephedrine, by one who has been mainly responsible for extending our knowledge of this important drug. The laboratory worker will be interested especially in the questions raised by the work on ephedrine and related substances regarding the difficult problem of the relation of chemical composition to pharmacological action, and the incompleteness of our knowledge of the mode of action of sympathomimetic drugs. He will also find of great value the compilation of published papers on the subject. A curious fact, not generally known, is that though ephedrine has only recently risen to popularity, and thus justified the traditional faith of the Chinese in one of their ancient remedies, the drug was known and experimented with 30 years before its possibilities were appreciated. At that time only toxic doses were employed, and the drug was set aside as being unlikely to be of value. Dr. Chen's work showed more clearly its true action. It resembles adrenalin, in that, in suitable doses, it raises the blood pressure, increases cardiac activity, relieves broncho-spasm, and dilates the pupil, while it more frequently inhibits than stimulates the gastro-intestinal tract. It has, however, the special advantage over adrenalin in that it is a stable substance. Its solutions do not decompose on exposure to air, light, or heat, or by long standing. It is easily absorbed, and has a low toxicity. It can be applied locally; and since it is not destroyed by the gastro-intestinal secretions it is active when given by the mouth as well as by subcutaneous injection. Because of these actions it has found many clinical uses, but the review suggests that it is especially valuable in relieving spasm of the bronchial muscle in such conditions as bronchial asthma, hay-fever, bronchitis, and whooping-cough, in combating the fall of blood pressure in spinal anæsthesia, and in shrinking the congested nasal mucous membrane. The introduction of ephedrine into the clinic is an important contribution to symptomatic treatment, but the remedy is not ideal, for it may produce side-effects, such as palpitation, trembling, faintness, and insomnia. Some of these symptoms are perhaps inevitable with a drug which has the general pharmacological action of ephedrine, but there is hope that important progress will be made in the search for related substances which will have all its advantages and none of its drawbacks.

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[1] Ephedrine and Related Substances. By K. K. Chen, Department of Pharmacology, Johns Hopkins University, and Carl F. Schmidt, Department of Pharmacology, University of Pennsylvania. London: Baillière, Tindall and Cox. 1930. Pp. 121. 11s. 6d.

FOREIGN BODIES IN THE EAR AND NOSE.

AMONG 15,000 children examined at a clinic for nose, throat, and ear defects, Mr. J. A. Keen [1] found 73 cases of foreign bodies in the nose or ears—an incidence of rather less than 0·5 per cent. All but two came to the clinic for some other reason. Of foreign bodies in the ears, the commonest (22 out of 43) were small pieces of cotton-wool deep in the meatus, usually beyond the isthmus. Removal with fine dressing forceps is easy, but syringing often fails to dislodge them and forcible syringing is not, of course, advisable in the presence of otorrhœa. Often removal of the wool stopped a discharge which had been unsuccessfully treated for weeks. The other foreign bodies (21 cases) included cardboard, beads, slate pencils, and crayons. Glass beads were particularly difficult to remove and the best instrument was found to be a malleable silver probe, whose end could be bent into a fine hook which could be slipped into the eye of the bead. A small foreign body which has been in the meatus for some time becomes surrounded by cerumen and its presence is not suspected. In no case in this series was operation needed, as it sometimes is in children under four, but occasionally an anæsthetic was required. Most of the 30 foreign bodies in the nose were beads and buttons, but one was a pure rhinolith. About half the children were dealt with in the out-patients' department, a little 10 per cent. cocaine solution being applied to the septum and the anterior part of the inferior turbinals. The instrument used was the malleable probe introduced above the foreign body and worked downwards, or the ordinary nasal dressing forceps. One case was the starting point of a long and fatal illness resembling the rare disease described as rhinitis caseosa by StClair Thomson. The most important aspect of foreign bodies in the nose, however, is their association with nasal diphtheria. Burton and Balmain [2] say that in children suffering from a chronic unilateral nasal discharge (sent to isolation hospital because a nasal swab is positive to the Klebs-Löffler bacillus), this association is common. These children did not suffer from clinical diphtheria, though they may be carriers, and the nasal diphtheria is cured by the removal of the foreign body. Mr. Keen admits that text-books advise that a culture of the nasal secretion should be taken before removal of a foreign body, but in his experience this is not advantageous.

RAMISECTION IN SPASTIC WEAKNESS.

JUST a year ago we published a paper [1] by a group of London orthopædists and neurologists in which they described six cases operated on by Mr. N. D. Royle for spastic weakness, and gave their opinion that the operation appears to have no place in the treatment of this condition. It will be recalled that this verdict was by no means accepted by Mr. Royle,[2] nor by some of his supporters in Australia and America. Accordingly, the Royal College of Surgeons of Australasia, at its annual meeting, has appointed a committee to investigate in Victoria the condition of patients on whom the operation has been performed. The members [3] are Prof. F. Wood Jones, F.R.S. (chairman), Sir Richard Stawell, Dr. Fay Maclure, Dr. H. C. Trumble, Dr. A. E. Coates, Dr. J. B. Colquhoun, and Dr. H. F. Maudsley. Another committee is to report on cases in New South Wales.

HEAD MURMURS.

Dr. Louis Hamburger [4] revives the interesting subject of auscultation of the head. As long ago as 1833, he says, Dr. John Fisher suggested that auscultation might prove an important means of diagnosis of cerebral diseases, but for many years little attention was given to it.

The murmurs, Hamburger points out, may be either intracranial, extracranial, or infracranial in origin. Of the first group—those arising inside the skull—the systolic murmurs of childhood are pretty well known. They may be heard especially during the second year of life, and not infrequently below this age. They may be detected in quite healthy babies, but are very seldom heard after the age of four, and almost never persist into adult life. Anæmia and rickets are thought to be contributory factors in their causation, but the way in which they arise is not exactly explained. Hamburger, however, feels sure that they are without pathological significance, and suggests that frequent examination for them would more often demonstrate their presence. At the same time it might occasionally give rise to needless despondency, as apparently happened in a case which he mentions. The second group of murmurs are those accompanying arterio-venous aneurysms, and though, of course, rare, they are well recognised as arising either from trauma or "spontaneously," in which case they are often congenital. The latter group may be due to aneurysmal angiomata; the former may result, as in cases of "pulsating exophthalmos," from a communication between the internal carotid artery and the cavernous sinus, following fracture of the base of the skull. Such, however, are real surgical rarities. A third group of murmurs are those found with intracranial tumours, such as meningiomas and gliomas, but they are exceedingly rare, whilst in uncomplicated intracranial aneurysms a murmur is almost never present. Occasionally there may be vascular communications between the external and internal blood-supply of the skull, producing a murmur on auscultation. In the final group of cases head murmurs are conducted upwards from the carotids, and include those occurring in severe arterio-sclerosis, in exophthalmic goitre, and sometimes with valvular disease of the heart. These may be noticeable to the patient as well as to the observer.

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[1] Jour. Laryng. and Otol., 1930, xlv., 333.

[2] THE LANCET, 1929, i., 977.

[1] THE LANCET, 1930, ii., 127.

[2] Ibid., p. 1209.

[3] Med. Jour. Australia, May 23rd, p. 637.

[4] Amer. Jour. Med. Sci., 1931, clxxxi., 756.

As a rule the detection of a cephalic murmur is of academic rather than practical importance, though in the diagnosis of arterio-venous aneurysm or angiomata it may be of great value. A revival of cephalic auscultation, in the absence of a full realisation of its limitations, would add to the anxieties of practitioners, without much increasing the information at their command.

VENEREAL DISEASE IN THE BRITISH EMPIRE

THE fifth Imperial Social Hygiene Congress organised by the British Social Hygiene Council opened in London on July 13th under the chairmanship of Mr. L. S. Amery, and the first day was devoted to a review of social hygiene and venereal disease throughout the Empire. Dr. David Lees, chairman of the medical advisory board of the Council, remarked that every country in the world contains enough infected people to constitute a grave problem. There were, he said, striking examples—in Cyprus, Malaya, and Madras, for instance—of what could be attained in spite of great difficulties by careful expenditure on the three essential methods of combating venereal disease: education and public enlightenment; free and efficient treatment; and an adequate staff able to deal with the problem sympathetically and from a public health point of view. Legislative measures, in his opinion, had not been in force long enough to allow a fair estimate of their success. Nevertheless the representatives of Australia and New Zealand maintained that the legislative enactments in those countries had yielded highly satisfactory results. Dr. F. McCallum, reading a paper by Dr. M. J. Holmes, Director of the Division of Tuberculosis and Venereal Disease, said that in Australia the control of the disease was based on treatment by qualified medical men only; an obligation on sufferers to place themselves under treatment without delay; a written warning of the consequences and dangers of the disease, handed to the patient by the doctor; compulsory, impersonal, and confidential notification; and personal but confidential notification of default. Similar regulations are in force in New Zealand, where gonorrhœa and syphilis were declared in 1924 to be infectious diseases, thus giving the Department of Health the same powers as in dealing with other infectious diseases—viz., the power to order an infected person to hospital and to institute legal proceedings against anyone who wilfully permits or suffers any act likely to infect another. Dr. Bernard Myers, presenting a report by Dr. Watt, Director-General of Health for New Zealand, endorsed this encouraging view of legislation but commented on weak spots in the system: fictitious names and addresses given by patients; treatment of venereal disease by chemists; and the failure of medical practitioners to comply strictly with the law. It is hoped that the ethical bodies of the doctors and pharmacists will be able to deal with this trouble.

Among the many reports presented from other Dominions and Colonies, India was represented by that of Col. A. J. H. Russell, and Madras in particular by a report from the Surgeon-General. Unfortunately in many parts of India "financial stringency"—a false view of economy, as many would say—has prevented progress. There is still a great lack of welfare work among sailors, particularly Indian sailors, in the ports, and salvarsan and kindred drugs have not yet been exempted from customs duty. Sir Ronald Storrs gave an account of his experience with a military government in Jerusalem. The brothels had been immediately closed throughout Judea and their occupant repatriated; a women's social council had been formed and a social welfare worker appointed. In Cyprus the Government had appointed a social hygiene council, a venereologist, a bacteriologist, and a social worker, and there had been a steady arousal of interest among the women of Cyprus. The Cyprus clinics were now the best in the world, because the most recent. In three years 12,000 cases had been treated and a reduction of 32 per cent. in the incidence had been effected. In Basutoland, Dr. K. H. Dyke reported that an average of 7000 new out-patients are seen in the dispensaries every year and syphilis is widely prevalent. One of the chief troubles of the district is that the natives have no dread of the diseases, but fortunately they like having injections and it is therefore easy to use the sulfarsenol which the Government has provided this year. The treatment of gonorrhœa has not been attacked actively. In Zanzibar Dr. S. M. Vassallo finds a curious mixture of modesty and the reverse. Modesty unfortunately begins with the necessity for treatment, and, although inoculation has made a great impression on the natives' imagination, this effect has the disadvantage that they expect inoculation for everything. Dr. R. S. Taylor ascribed a great increase in venereal disease in Somaliland to famine, which had driven women to vice. Dr. J. W. Graham, medical officer of Tanganyika Territory, declared that the future of Africa was in the hands of the women. With their emancipation the social customs of the Africans would be greatly improved.

The Conference continues throughout the week and other aspects of the problem are being discussed.

A NEW FLOCCULATION TEST.

FLOCCULATION tests for syphilis which depend on the fact that precipitation occurs when a syphilitic serum is treated with organ extracts, are of most use in treated cases of syphilis where they remain positive longer than the Wassermann reaction does. It would appear that more lasting results are obtained when the duration of treatment is controlled by application of a flocculation test. In the most recent comparative survey of the value of the different flocculation tests with known sera,[1] the Kahn test produced the most satisfactory results, giving no false positives and showing itself to be more sensitive than the Wassermann reaction in treated cases. The Vernes reaction presents a theoretical advance on the other methods inasmuch as it minimises the personal error by introducing mechanical mixers and photometric readings. This reaction fails, however, in comparison with other flocculation tests because of the expensive apparatus required and because it is certainly not less sensitive to treatment than the Wassermann reaction. In the newer tests the Meinicke clarification reaction and the Kline show great promise since they give a high degree of agreement with the minimum of manipulation. For the new Meinicke test it is claimed that hæmolytic, icteric, and cloudy sera are all adaptable to the reaction, and that a falsely positive result can never be produced by the admixture of blood or other contaminations with the sera. It is a modification of the author's turbidity reaction and was first described by him in 1929. Dr. W. Ogden and Mr. F. Partner, working at the Central Pathological Laboratory of the London County Council Mental Hospitals, have compared the new Meinicke clarification reaction with the Wassermann reaction and find total agreement in 96·6 per cent. of sera. (see p. 121). Of those sera showing disagreement the results were in favour of the Meinicke. This test is said to be easy to read and can be performed rapidly with small quantities of serum (micro-reaction), though the macro-reaction is regarded as more reliable. It is held to be desirable that workers using this test should adhere to the method described by its originator.

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[1] Brit. Jour. Vener. Dis., 1931, vol. vii., No. 2.

TREATMENT OF HICCUP.

PERSISTENT hiccup, which may cause much discomfort and distress and even endanger life, is often difficult to relieve. R. F. Sheldon[1] amongst others has shown that carbon dioxide inhalation, by its direct action on the respiratory centre, is the most reliable means of re-establishing normal breathing. A great objection to this form of treatment is, of course, the need for cumbersome and expensive apparatus. L. A. Golden,[2] however, uses an ordinary paper bag which is placed tightly over the mouth and nose. The patient is instructed to breathe into the bag, and by rebreathing his expired air raises the concentration of carbon dioxide in his blood until, in five minutes or so, the spasmodic inspirations are replaced by regular ones.

THE SELECTION OF OUT-PATIENTS.

IT was to be anticipated that one of the most interesting discussions at the recent joint conference of the British Hospitals Association and the Incorporated Association of Hospital Officers at Eastbourne was that which dealt with the out-patient department.[3] The voluntary hospitals are having to cope with an almost alarming increase, not only in the number of out-patients, but in the ratio of their attendances. Since 1920 the out-patients of the London teaching hospitals have grown by something approaching 10 per cent. in number and by close upon three times that percentage in attendances. These attendances are now little short of four millions in this group of hospitals alone, and almost every annual report from institutions all over the country records a corresponding increase. The papers which formed the basis of the discussion were read by Mr. W. Parkes, the secretary of St. Mary's Hospital, Paddington, and Mr. W. McAdam Eccles, consulting surgeon to St. Bartholomew's Hospital, whose joint experiences cover the administrative and the medical aspects of this subject. There was general agreement both in the addresses and in the discussion that, although, except as regards chronic cases, there is not much real abuse of the out-patient system, some means of limiting the numbers will have to be found, not less for the sake of the medical staff than of the patients. The limitation must not be too rigid. Access to a hospital must be reasonably easy, and, as Mr. Eccles put it, it is essential that there should be "a good and varied supply of out-patient material for teaching purposes."

The crucial question is how this limitation is to be brought about. To eliminate the "chronic ordinary" is clearly the first step—if an out-patient department is to be a real consultative centre he is matter out of place, standing in the way of those who are really in need of specialised advice and treatment. The recommendation that a doctor's letter should be an essential passport for an out-patient department appears to have obtained something less than general assent at the conference; the alternative is a laborious winnowing process at the hands of the medical staff and their assistants. Closer understanding and coöperation between local medical practitioners and the hospital staffs would obviously make it easier to discriminate cases needing help from a consultant, though this does not imply refusal to admit the right of the remainder to present themselves at the hospital. The voluntary hospitals cannot risk getting a bad name because their rules are too rigid in this respect. But the present unorganised system not only invites abuse, but entails another form of discipline more irksome sometimes than exclusion. The dreary wait in the out-patients' department will have to be mitigated somehow. We drew attention recently[1] to the efforts made in some hospitals to make and keep appointments, pointing out that such appointments can be made for small groups rather than individuals to secure continuity of attendance without gaps. The careful reorganisation involved would be repaid in the better atmosphere, and possibly even in increased donations from those who appreciate being treated with consideration.

AN APOLOGY.

BY the courtesy of the Board of Control a proof the Annual Report for 1930 was sent to THE LANC in common with other medical journals. Such advan information is supplied in order to allow sufficient time for perusal before publication of the Report, on the understanding that no comment will be made before a copy is received from H.M. Stationery Office. By a series of mischances the usual precautions against premature publication proved ineffective, and a notice of the Report, which has not yet been issued, appeared in THE LANCET on July 11th. We greatly regret this unfortunate incident, and offer full apologies to the Board.

WE have to announce the death of Mr. Francis Richardson Cross at Clifton, on Sunday last, at the age of 83. Mr. Cross was consulting ophthalmic surgeon to the Bristol Royal Infirmary and a former President of the Ophthalmological Society. He served on the Council of the Royal College of Surgeons of England for 16 years.

INDEX TO "THE LANCET," VOL. I., 1931.

THE Index and Title-page to Vol. I., 1931, which was completed with the issue of June 27th, is now in preparation. A copy will be sent gratis to subscribers on receipt of a post-card addressed to the Manager of THE LANCET, 7, Adam-street, Adelphi, W.C.2. Subscribers who have not already indicated their desire to receive Indexes regularly as published should do so now.

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[1] Anæsth. and Analg., 1927, vi., 31.
[2] New Eng. Jour. of Med., June 4th, 1931, p. 1183.
[3] The Hospital, July 1931, p. 152.

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[1] THE LANCET, 1931, i., 595.

MODERN TECHNIQUE IN TREATMENT

A Series of Special Articles, contributed by invitation.

CCCXVII.

THE TREATMENT OF
DYSHIDROSIS OR CHEIROPOMPHOLYX.

DYSHIDROSIS was first described by Tilbury Fox and at about the same time by Hutchinson who named it cheiropompholyx. From that time to the present day the condition has been the subject of lively controversy in all parts of the world. The eruption, which is accompanied by considerable itching, occurs chiefly on the lateral aspects of the fingers and toes, and on the palms and soles, though it may involve also the dorsal aspects of the toes, feet, and hands, and occasionally may extend to the wrists and forearms. It consists of pearly vesicles embedded in the epidermis which in severe cases may become confluent to form bullæ of considerable size. In the palms and soles the vesicles are deeply situated, and owing to the thickness of the overlying horny layer they seldom rupture. They feel shotty and have aptly been compared to sago grains embedded in the skin. In mild cases the lateral aspects of the fingers only may be affected. Dyshidrosis occurs, as a rule, in hot weather and affects chiefly subjects who sweat freely. The duration of an attack varies from three to six weeks. While the acute vesicular stage is usually over in from 10 to 14 days, a desquamative stage follows which may last for several weeks.

Dyshidrosis Complicating Recognised Dermatoses.

As the name implies, Tilbury Fox regarded dyshidrosis as a disorder of the sweat apparatus, but this view lost favour as the result of further studies by English and Continental investigators, who found no pathological evidence of damage to the sweat glands or their ducts. At the present moment there are some who, doubting its existence as a clinical entity, believe that dyshidrosis is merely a special aspect of a number of well-known dermatoses. The following case illustrates this point of view. An elderly lady had suffered for about a year from attacks of typical dyshidrosis affecting especially the hands. She had undergone treatment at a Continental spa without relief. The cause was discovered in a very chronic interdigital ringworm infection of the toes. Examples of this kind could be multiplied indefinitely.

An examination for fungus should be made in every case of dyshidrosis. The cause is usually the *Epidermophyton inguinale*, a fungus which has a predilection for moist intertriginous surfaces. The toes are very commonly attacked and in this situation the infection is nearly always chronic. The fungus secretes an endotoxin which entering the blood stream gives rise to a dyshidrosiform eruption on the hands. This mechanism has been demonstrated by human experiment and explains the frequent absence of fungus in the acute vesicular eruption of the hands. The acute vesicular eruption may, on the other hand, be due to direct infection.

Ringworm infection disposes of an important proportion of the cases of dyshidrosis. The thrush fungus *Monilia albicans* is also capable of causing dyshidrosis, and recognition of its importance is growing. A number of exogenous irritants may produce a condition objectively identical with dyshidrosis. The subjects attacked are chiefly those who suffer from hyperhidrosis of the palms and soles. The hands are attacked first and, by a mechanism not yet explained, the feet often follow suit. The exogenous origin is elucidated by careful inquiry regarding the patient's occupation.

Dyshidrosis may be a manifestation of seborrhœic eczema. It is well recognised that chronic seborrhœic eczema of the scalp and of other parts may be accompanied by an eruption of the palms and soles identical with dyshidrosis. Dyshidrosis may accompany seborrhœa, or seborrhœa with dandruff, but here it is perhaps a question of true dyshidrosis. Dyshidrosis may be a manifestation of eczema of any type, for example, chronic varicose eczema, pruritus ani, with eczematization, &c. In such cases dyshidrosis is probably due to sensitisation of the skin of the palms and soles by the products of tissue autolysis derived from the chronic foci.

True Dyshidrosis.

Having thus considered the cases of dyshidrosis complicating well-known dermatoses it is necessary to inquire whether there are any left which may be regarded as true dyshidrosis. The question may be answered by stating an indisputable fact—namely, that there are many who, in the complete absence of any of the causes already enumerated, develop dyshidrosis every summer or even at intervals throughout the year. Further, the attacks follow the typical course already described lasting from three to six weeks, though many mild cases affecting only the fingers are known. Almost all cases have hyperhidrosis. It is, in fact, probable that the conception of Tilbury Fox will prove eventually correct and that time will demonstrate beyond doubt the existence of a true dyshidrosis and of a causal disorder of the sweat apparatus. Evidence of such a disturbance has already been reaffirmed by Sicoli, who has demonstrated dilatation with occasional rupture of the intra-epidermal portion of the sweat ducts, in cases of dyshidrosis. Unfortunately, owing to the difficulty of collecting sweat in adequate quantities, its chemical composition in normal and in pathological states such as dyshidrosis does not yet appear to have been the subject of important study. It is, however, known that variations in its composition occur under varying physiological conditions—for example, lactic acid is excreted in quantity at certain stages of muscular training. While mere mechanical dilatation of the sweat ducts due to explosive secretion of sweat as suggested by Sicoli may not prove the whole explanation of dyshidrosis, it is possible that future studies of the chemistry of sweat may provide a further clue to its pathogenesis.

It is clear that the diagnosis can only be made by exclusion. It may not be difficult to eliminate the cases of dyshidrosiform eruptions due to obvious exogenous causes or those which accompany eczema of other parts; the treatment of such cases must be that of the cause. But it may be extremely difficult, when the eruption is limited to the palms and soles, to eliminate fungus infection. Indeed so many cases of dyshidrosis are caused by ringworm infection that it is desirable to consider the treatment of the disease under two headings: (1) mycotic dyshidrosis; (2) true dyshidrosis.

Mycotic Dyshidrosis.

Regarding dyshidrosis as a special type of eczematous reaction, it is a remarkable fact that cases of mycotic origin will tolerate strong fungicidal preparations that would be harmful in non-mycotic or true dyshidrosis. When the presence of *Epidermophyton interdigitale* has been demonstrated one should not hesitate to attack it vigorously. The interdigital spaces should receive the greatest attention, and it is important to realise that the infection is nearly always difficult to cure in this position; it may, in fact, be of life-long duration. The spaces are generally lined with tough dead white sodden epidermis, and the fungus proliferates freely beneath this protective covering, to remove which strong keratolytic preparations are necessary. Whitfield's benzoic and salicylic acid ointment may be effective :—

Benzoic acid	grs. 25
Salicylic acid	grs. 15
Soft paraffin	drs. 2
Coconut oil	to 1 oz.

or the following paint also suggested by Whitfield :—

Benzoic acid	grs. 25
Salicylic acid	grs. 15
Acetone..	drs. 2
Spirit	to 1 oz.

Sabouraud recommends the preliminary application of a depilatory paste, e.g. :—

Barium sulphide	1	
Quicklime	10	
Rice starch	10	(Darier)

to be mixed with a little glycerin to make a paste and applied from half to three-quarters of an hour daily.

He states he has succeeded in curing interdigital epidermophytosis only by such preliminary treatment.

After the horny debris has been thoroughly softened and removed a paint may be applied twice daily :—

Chrysarobin	dr. 1
Acetone	drs. 4
Spirit	to 1 oz.

or carbol fuchsin paint (Castellani) :—

Saturated alcoholic solution of basic fuchsin 10 c.cm.
Five per cent. aqueous solution of phenol .. .. 100 c.cm.
Filter and add boric acid, 1 g.
Stand for two hours, add acetone 5 c.cm. Stand for two hours, add resorcin, 10 g. Keep in a dark bottle.

For the dyshidrosiform eruption the feet and hands may be soaked twice daily in a solution of potassium permanganate, 1 in 500 to 1 in 1000, together with nightly applications of Whitfield's ointment. If the latter be applied for too long a period, however, it may itself cause an irritant dermatitis and should then be replaced by an emollient preparation such as cold cream.

True Dyshidrosis.

The above treatment would be disastrous in the case of non-mycotic dyshidrosis. As already stated, this condition runs a limited course and no means of aborting an attack in the early stages are yet known. The methods of treatment applicable to the various stages of eczema should be employed. In the acute vesicular stage simple lotions or watery pastes are best—e.g., lead lotion, calamine lotion, or the following preparation: glycerin, talc, zinc oxide water, āā p. æ. If secondary pustular infection be present it is advisable to open and swab the pustules twice daily with an antiseptic lotion, e.g. :—

Copper sulphate	2
Zinc sulphate	7
Camphor water	300, diluted 1 in 10.

In the early desquamative stage creams and pastes should be employed, e.g. :—

	Ichthyol	♏ 5
	Zinc oxide, olive oil ..	āā 1 oz.
	Anhydrous wool fat	drs. 2
	Lime water	drs. 6
or	Zinc oxide, starch	āā drs. 1½
	Soft paraffin..	to 1 oz.

In the final stages mild keratoplastic pastes may be employed, such as :—

Ichthyol	♏ 5
Liq. pic. carb.	♏ 30
Zinc oxide, starch	āā drs. 1½
Soft paraffin	to 1 oz.

Throughout the treatment it is advisable to keep the hands at rest as much as possible, and there is little doubt that complete rest in bed shortens the duration of an attack. As in eczema generally, soap and water is badly tolerated and the hands may be cleansed only with olive oil or normal saline.

Prevention.

Unfortunately, no dietetic restrictions or treatment with drugs appear at present to serve any useful purpose, and the only preventive treatment consists in mechanical inhibition of the activity of the sweat glands by means of X rays. In some cases this form of treatment has been remarkably successful. For example a boy aged 12, an out-patient attending the West London Hospital, had suffered for three years from frequent attacks of dyshidrosis; he was obese and sweated profusely. The course of X rays advised by Sicoli—namely, three doses of 4 H unfiltered at 15 day intervals—was given by Dr. Carter-Braine at the hospital. The attacks ceased and have not recurred after three years. Bigger dosage with heavy filtration has also been proved effective.

It must be admitted, in fact, that in the present state of knowledge regarding the pathogenesis of true dyshidrosis the only practical method of preventing future attacks is the purely mechanical measure of causing partial atrophy of the sweat glands by X rays.

G. B. Dowling, M.D., M.R.C.P. Lond.,
Dermatologist to the West London Hospital; Assistant Physician to the Skin Department, Guy's Hospital.

THE SERVICES

ROYAL NAVAL MEDICAL SERVICE.

Surg.-Lt. C. G. Rippin is placed on the retd. list.

R. M. B. Lowis to be Surg. Lt.

Proby. Surg. Sub-Lt. W. E. Thomas to be Surg. Sub-Lt.

ROYAL NAVAL VOLUNTEER RESERVE.

Proby. Surg. Lt. C. A. Mather to *Victory* for Haslar Hosp.

Surg. Lt.-Comdr. (D.) A. G. Pridham to *Vivid* for R.N. Barracks.

ROYAL ARMY MEDICAL CORPS.

Lt. A. Guirdham resigns his commn.

R. H. Small is granted a temp. commn. in the rank of Lt.

ARMY RESERVE OF OFFICERS.

Col. G. M. Goldsmith, late R.A.M.C., having attained the age-limit of liability to recall, ceases to belong to the Res. of Off.

TERRITORIAL ARMY.

Lts. W. H. M. Jones, W. L. Lamb, and J. N. Russell to be Capts.

R. S. T. Sandberg (late Offr. Cadet, Lond. Univ. Contgt. Sen. Div., O.T.C.), A. D. Bourne (late Offr. Cadet R.Q.M.S., Lond. Univ. Contgt., Sen. Div., O.T.C.), and F. H. Taylor (late Offr. Cadet, Univ. of Durham Contgt., Sen. Div., O.T.C.) to be Lts.

Medical Prayer Union.—In connexion with the British Medical Association's meeting next week a medical missionary breakfast will be held under the auspices of the Union on Friday, July 24th, at Stewart's Restaurant, Victoria-place, Eastbourne, at 8.30 A.M. The chair will be taken by Dr. W. G. Willoughby, president of the Association, and an address will be given by Dr. A. R. Cook, of Uganda. Those who intend to be present are asked to inform Dr. Victor G. Williams, 6, College-road, Eastbourne.

SPECIAL ARTICLES

THE BACTERIOLOGICAL CONTROL OF MILK-SUPPLIES.

By James McIntosh, M.D. Aberd.,
DIRECTOR OF THE BLAND-SUTTON INSTITUTE OF PATHOLOGY, THE MIDDLESEX HOSPITAL; PROFESSOR OF PATHOLOGY IN THE UNIVERSITY OF LONDON;

AND

Lionel E. H. Whitby, *C.V.O.*, *M.C.*, M.D. Camb., M.R.C.P. Lond., D.P.H.,
BACTERIOLOGIST TO THE MIDDLESEX HOSPITAL.

The problem of obtaining an efficient and good milk-supply for an institution such as a hospital involves a consideration of the economic aspect, of the nutritional value, and of the cleanliness and wholesomeness of the milk.

The economic aspect is concerned not only with the question of actual cost, which, for an institution, must be reasonable and therefore tends to prohibit the use of high-grade milk, but also with the matter of keeping qualities which, being intimately bound up with the bacterial content and therefore controllable, has received considerable attention from the large dairy companies.

As to nutritional value there has been much discussion in the press and in Parliament as to the relative values of the different grades of milk, but on the whole the expensive high-grade products are outside the purse of the average hospital; for an institution the problem resolves itself into the purchase of milk of good average nutritional value.

The question of cleanliness and wholesomeness is one that can be partly *safeguarded* by modern methods and without undue expense. It is with this aspect that we have been mainly concerned. We have examined in a routine manner both for the total bacterial content, which largely governs the keeping qualities, and for the presence of pathogenic bacteria, particularly the tubercle bacillus. Our investigations on the Middlesex Hospital milk-supply have extended over some six years. As the result of our experience we feel justified in offering considerable criticism both of the standard technique for determining total bacterial content as well as of the popular "holding" method of pasteurisation, and we would emphasise the necessity for continuous as distinct from intermittent bacteriological control.

Standards of Cleanliness.

It is recognised that a limited number of bacteria are unavoidable contaminants, but large numbers are, with healthy cows, some index of the care and cleanliness in production, handling, transport, and storage. A sample which has a high bacterial content soon after milking shows either that the milking process has been carried out under unhygienic conditions or that the cow, owing to disease, is unfit to contribute milk to the pooled supply of the farm; in older samples, high bacterial content points to faulty storage, whilst a constant low count in an untreated sample indicates care at all the stages from the cow to the consumer. From the point of view of bacteriological control, examinations made should be both quantitative and qualitative, the former for an estimate of wholesomeness, a check on the handling and distribution, and the latter for detecting the presence of pathogenic bacteria. Thus the important features to insist on are: (1) the absence of living tubercle bacilli, (2) the absence of epidemic-producing bacteria, (3) a reasonable bacterial content such as will not impair the keeping qualities.

To meet these requirements three main methods have been advocated:

(*a*) Rigorous and expensive standards for cow, milker, method of milking and transport, with the object of supplying untreated milk with a low initial bacterial content—Certified Milk.

(*b*) Less stringent but still expensive methods for the production of the various forms of Grade A Milk (Grade A, tuberculin tested; Grade A; Grade A, pasteurised).

(*c*) The efficient pasteurisation of milk from reasonably well-conducted farms.

Types of Milk Examined.

GRADE A, T.T. MILK.

The legal standard under the Milk (Special Designations) Order, 1923, is a limit of 200,000 bacteria per c.cm. We have examined a number of samples of the Grade A, T.T. milk as supplied to the hospital, and on one occasion only the bacterial content was above the legal limit (Table I.). On two or three occasions, in the summer months, the supply has been sour before the sealed bottles were opened. It would seem, therefore, that unless a constant analysis is made there is no evidence that Grade A milk is always as pure as the labelled bottle would lead one to believe. The same case can be made against tuberculin-tested samples, for who is to say that a cow may not become tuberculous in the intervals between the tuberculin test.

TABLE I.—*Grade A.*

	Bacteria per c.cm.		Bacteria per c.cm.
1925.		1927.	
May	280,000	September	1,350
"	2,375	"	2,025
June	3,650	"	7,500
"	3,733	"	1,900
July	35,500		
August	7,075	1931.	
September	5,150	May	5,125
November	5,906	"	825
1926.			
January	1,227		
"	652		

Admittedly the nutritional value of Grade A milk is high but, in common with Ledingham[1] and the majority of medical men, we are of the opinion that in hospitals, at least, the Grade A milk should be efficiently pasteurised before distribution in the hospital. The inference from this opinion is that the value of Grade A milk is mainly nutritional and that provided a *milk of similar character is obtained* and efficiently pasteurised then there is no advantage at all in using the much more expensive Grade A and Certified products.

ORDINARY MILK.

For the past six years regular quantitative analyses of the churn milk supplied on contract to the Middlesex Hospital have shown that the milk, as supplied, has such a high bacterial content, particularly in the summer months, that the *keeping qualities* are almost negligible (Table II.). Examinations for tubercle bacilli by animal inoculation have from time to time proved positive.

The efficiency of the hospital pasteuriser has been checked by parallel analyses made before and after pasteurisation (Table II.) and these show that the initial high bacterial content can be reduced to a few thousands per c.cm. No tubercle bacilli have been detected in the pasteurised samples. The necessity for keeping a regular watch on the efficiency of a pasteuriser has been evident from time to time.

TABLE II.—*Ordinary Hospital Milk.*

	Bacteria per c.cm.			Bacteria per c.cm.	
	From churn.	After pasteurisation ("flash").		From churn.	After pasteurisation ("flash").
1924			1927.		
July	14,000,000	4,240,000*	May	28,500,000 ..	6,000
Aug.	18,500,000 ..	300	July	19,650,000 ..	39,000
Oct.	200,000 ..	100	Aug.	1,150,000 ..	20,000
Dec.	300,000,000 ..	220	Sept.	130,000 ..	750
			Oct.	13,000,000 ..	235,000
1925			"	72,000 ..	1,100
June	199,000 ..	840			
			1928.		
1926.			Jan.	265,000 ..	100
Sept.	565,000,000 ..	3,400	Feb.	35,000 ..	1,500
"	9 000,000 ..	21,000	April	160,000 ..	3,450
			May	440,000 ..	65
1927.			July	33,000 ..	600
Jan.	2,300,000 ..	5,600	Sept.	20,000,000 ..	1,500
April	135,000,000 ..	1,670	"	3,250,000 ..	150

* Pasteuriser thereafter modified and readjusted.

The Ministry of Health definition of pasteurisation is "the retention of milk at a temperature of not less than 145°F. and not more than 150° F. for at least half an hour and then immediate cooling to a temperature of not more than 55° F., the milk being heated once only and not otherwise treated by heat." This is a description of the "holding" method as practised by most of the large dairy companies. The hospital pasteuriser was worked on the "flash" principle in which the milk was rapidly heated to 160°–165° F. in a space of about four minutes and then quickly cooled to 40°–45° F. by flowing over water- and brine-cooled pipes. We have been unable to detect any alteration in taste or character of the milk so pasteurised, and in view of our bacteriological findings on milk pasteurised by the "holding" method (Tables III. and IV.) we submit that the "flash" principle is the better method. We do not condemn the "holding" method, but we consider it is very liable to fail on occasions which are not easy definitely to foresee for reasons which we shall presently state. It is quite evident that if a milk of good nutritive value is obtained pasteurisation efficiently carried out provides a method of rendering the milk clean and wholesome.

TABLE III.—"*Pasteurised*" *Milk supplied to the Hospital.*

	Bacteria per c.cm.		Bacteria per c.cm.
1926.		1929.	
March	62,500	April	177,500
May	28,300,000	Aug.	64,850
Aug.	20,000,000		
Sept.	314,000,000	1930.	
Oct.	390,000	May	5,100
		July	500,000
1927			
Nov.	66,200	1931.	
		Feb.	61,250
1928.		May	727,500
Nov.	29,000		

PASTEURISED MILK.

The samples of this type of milk have been mainly that sold to the hospital as "pasteurised milk" (Table III.), that is, milk which under the Milk (Special Designations) Order should not contain more than 100,000 organisms per c.cm. During the warm months, May–September, these samples have often had a bacterial content of several millions.

This fact was further brought home to us by the finding of many millions of viable organisms per cubic centimetre in some samples of "pasteurised milk" sent to us for analysis by the Medical Officer of Health of Islington in the summer of 1928 (Table IV.). It may be said without prejudice that these samples came from a retail shop of a large firm of dairymen whose pasteurising plant is the most up to date in the world; a firm who make every effort to supply the public with clean and wholeso milk and who employ a staff of highly trained bacteriologists and chemists to assist them in so doing. The result of our analysis came as a bombsh to the dairy company, but they gave us every oppo tunity to confirm our findings with other samp both from their retail depôts and from th pasteurising centres. This we were able to (Table IV.), though the bacteriologists of the compa were, with parallel samples, getting results whic were well within the legal limit. There was naturall considerable discussion, entirely amicable, to accou for the discrepancies in the parallel examination which resulted in considerable instruction to ourselve and them. The discrepancies were traced to difference in the technique of the examination, a the high bacterial counts were found to be due mai to heat-resisting bacteria.

TABLE IV.—*Pasteurised Milk.*

—	Source.	Bateria per c.cm.
1928. July.	Dairy X, Islington.	156,000,000
		126,000,000
"	Dairy X, Direct.	1,088,000,000
"		876,000,000
Aug.	Dairy X, Hounslow.	1,082,000,000
Sept.		506,000,000
"	Dairy Y, Marylebone	2,400
1931. May	" Z, Paddington.	290,000

Technique of Examination.

Our usual technique for the hospital milk analys has been the making of ten-fold dilutions of the sample in sterile saline, ensuring proper mixing by shaking the dilutions in glass-stoppered bottles. The dilutions have been plated in ordinary agar and in litmus-lactose agar, both made from meat broth. On the other hand, the Ministry of Health circular, though recommending the making of dilutions in essentially the same manner, instructs the bacteriologists to plate out in agar medium made from peptone water and lemco. The formulæ of the three media are appended for comparison:—

	Ordinary agar.	Litmus-lactose agar.	M. of H. agar.
Water	—	—	1000 c.cm.
Meat extract ..	1000 c.cm.	1000 c.cm.	—
Peptone	10 g.	10 g.	3 g.
Sodium chloride ..	5 g.	5 g.	—
Lemco	—	—	3 g.
Lactose	—	10 g.	—
Agar	20 gr.	20 g.	15 gr.

It was very evident that the discrepancies between our results and those of the dairy company were due to the richness of our medium as compared with the poor nutrient value of that recommended by the Ministry of Health. Table V. shows the comparative results of two samples using the three media. The results, which are typical examples of several analyses, show firstly that our two media both detect more viable bacteria than the medium of the Ministry of Health and, secondly, that on some occasions the litmus-lactose agar is definitely superior to ordinary agar. The significance of this we shall discuss later.

The moral of the results is clear. That though it is highly desirable that the Ministry of Health should lay down a standard technique in order that results may be comparable, it is wrong that that echnique should involve the use of a medium of so poor a quality that it does not give any indication f the content of *viable* bacteria though the content limited by law to 100,000 per c.cm.

TABLE V.—*Pasteurised Milk.*

Sample.	Bacteria per c.cm. using various media.		
	Ordinary agar.	Litmus-lactose agar.	M. of H. agar.
1	20,000,000	24,000,000	5,000
2	8,000,000	36,000,000*	76,000

* Excess growth on litmus-lactose-agar due to thermoduric treptococcus.

NIFICANCE OF ORGANISMS GROWN ON RICHER MEDIA.

On the richer media we obtained heavier growths f all organisms that appeared on Ministry of Health edium. In addition, there were two organisms which we were unable to detect on Ministry of Health edium. It may be said with confidence that the dditional organisms did not have the slightest athogenic significance but, on the other hand, one any rate was of some economic importance for it as a short-chained streptococcus capable of rmenting lactose.

Briefly the organisms were of two main types: (1) *Bacillus.*—A thin Gram-positive non-sporing acillus belonging to the group known as thermoiles. It was capable of slow growth in agar at C. and appeared as minute pin-point colonies etable with a hand-lens. These colonies, if cultivated on to agar slopes, grew profusely when ncubated in a water-bath at 56° C. These were definite thermophiles, as described by Ayres and Johnson[3] the optimum temperature for which is said to be 47° C.–63° C., and were detectable in both agar and litmus-lactose agar. They had no fermentative power, they were found in the hot summer months and have been fairly thoroughly investigated in America. If once implanted into a pasteurising plant of the "holding" type they are liable to be a chronic nuisance.

(2) *Streptococcus.*—A short-chained streptococcus, often diplococcal, appearing as very small fusiform colonies particularly in litmus-lactose agar and easily detectable on account of the small surrounding zone of fermentation. This organism was not thermophilic but was definitely thermoduric, for it resisted immersion in a water-bath at 60° C. for one hour. This organism was also found in the summer months and successful cultivation was very definitely favoured by the presence of lactose in the medium. It is fair to infer that the lactose of milk favours the multiplication of this organism and that the Ministry of Health medium fails to detect the fact.

Discussion.

We have furnished sufficient evidence to show that milk pasteurised in large quantity by the "holding" method often contains more viable bacteria than the Ministry of Health will allow, but that the determination of this fact is not possible by using the methods advocated by the same authority. We strongly advocate that richer medium should be used for routine analyses. Our experience (e.g., Table I.) shows that provided the sample of milk is clean, the richer medium still gives results within the present legal standards. The dairy companies themselves are aware of the difficulties of dealing with thermophilic and thermoduric organisms and they do their utmost to eliminate the trouble, yet their "official" bacteriological examinations show that their methods of pasteurisation are sound. It is the dairy companies who have discovered that trouble with thermophilic bacteria is seasonal; that "foaming" and "pocketing" of the milk during passage through the numerous pipes favour the multiplication of thermophiles; that the use of a pasteurising plant for a consecutive period of *more than four hours* causes a *great increase* in thermophiles; that a breakdown in the plant causing delay or prolongation of the time of pasteurisation ("overholding") has the same effect. Thermoduric and thermophilic bacteria are very liable to be implanted in a pasteuriser when milk that has been previously heated is mixed with unpasteurised milk and the whole mixture then pasteurised—a process known as "seeding." The trouble would appear to be not so much with the dairy companies who are aware of a good many of the troubles that may be caused in the plant, but with the unscrupulous farmer, who to cover his dirty methods, heats the milk before sending it to be pooled with the rest of the dairy company's supply. This is the probable cause of the results given by two analyses which the dairy company asked us to make with our media—an analysis of the raw milk and then of the same milk as it appeared sealed and bottled at the other end of the pasteurising plant. The samples had more viable bacteria after pasteurisation than before (Table VI.).

TABLE VI.—*Milk from Pasteurising Centre of Dairy Company.*

Sample.	Bacteria per c.cm.	
	Raw milk.	Pasteurised milk.
1	632,000,000	1,088,000,000
2	7,000,000	24,000,000

There can be little doubt that large scale pasteurisation by the "holding" method does not always achieve the reduction of bacterial content which the Ministry of Health desire. And as it is probable that the blame for this failure does not rest with the dairy companies, there is provided another incentive for a closer control and supervision of the farmer with a view to stimulating him to attain a high standard of cleanliness and quality. Pasteurisation as generally used at present is not the last word in the provision of clean and wholesome milk.

SUMMARY.

(1) Bacteriological control of milk-supplies is an adequate control of purity if the analysis is properly performed. Control must be continuous and not intermittent. (2) Only by the use of media capable of growing delicate micro-organisms can a proper bacteriological control of milk be made. (3) The present method of analysis advocated by the Ministry of Health does not detect all viable bacteria. (4) Pasteurisation by the "holding" method is liable to fail with regard to killing thermophilic and thermoduric bacteria. (5) The "flash" method of pasteurisation

is less open to the above objection and at the temperature used (160°–165° F.) is not only efficient but produced no detrimental change in the milk. (6) Comments on the probable origin and the significance of the more important thermophilic and thermoduric bacteria.

REFERENCES.

1. Ledingham J. C. G.: THE LANCET, 1930, ii., 1368.
2. Ayres, S. H., and Johnson, W. T.: Jour. Bact., 1924, ix., 279.

MEDICINE AND THE LAW.

The End of the Jury of Matrons.

PARLIAMENT has at last abolished the jury of matrons as a part of our criminal law. The use of such a jury, to decide whether a woman convicted of a capital offence is pregnant or not, is of great antiquity, dating from times when medical science was non-existent or at any rate not commonly available. Had the occasions for its use been of greater frequency or publicity, its existence could hardly have been tolerated so long. Thirty years ago, the late Sir Harry Poland expressed the general view that the jury of matrons should be abolished, "but who," he added, "dare propose such an interference with the rights of women?" The answer is that the initiative has come from a woman Member of Parliament, representing a large proportion of women electors.

The Sentence of Death (Expectant Mothers) Act, which has now effected this reform, is strangely named, for it abolishes the death sentence where an expectant mother is convicted, penal servitude for life being substituted. It has long been the law that a pregnant woman should not be executed; the new statute saves her from a meaningless sentence. The change in the method of deciding the question of pregnancy is a more substantial matter. Formerly, the judge directed the immediate impanelling of a jury of twelve matrons or "discreet women" to answer the question. They were chosen *de mulieribus circumstantibus*, and, to prevent evasion of the duty, he would order the doors of the court to be shut. Unseemly scenes have been witnessed when women of a former generation, unused to any kind of jury service, scrambled to escape. It used to be said, indeed, that the attendance of feminine spectators at the Old Bailey diminished for a long time after such an incident at the trial of Katherine Webster in 1879. This ancient method of ascertaining pregnancy was far from infallible. In 1847, for instance, Mary Ann Hunt was convicted of murder in London. At the next session a jury of matrons was impanelled to try whether she was "with child of a quick child"; the matrons searched and examined and gave their verdict in the negative. She was left for execution, but the surgeon at Newgate reported to the Home Secretary to the contrary. The latter, showing, as Sir Harry Poland used to say, wisdom not less than that of Solomon, declared that a few months would settle the question. A few months later the child was born.

The new method of deciding the question of pregnancy is remarkable. Obsessed with the preservation of the ancient forms of British justice, Parliament has now entrusted the decision to the trial jury, who need not be resworn for the purpose. If there is no trial jury, or if the trial jury has disagreed on the question, a new jury is to be sworn specially for the purpose. Finally the woman has a right of appeal from the jury's verdict that she is not pregnant. All this is cumbersome and otiose. Is it really necessary to detain twelve jurors from their everyday work to undertake this investigation? Need the time of the Court of Criminal Appeal be occupied with such appeals? The evidence is bound to be medical in character; it could perfectly well be obtained directly by the judge from medical practitioners. It does not seem to have occurred to Parliament or the Home Office that the Irish precedent was preferable. More than fifty years ago the Juries Procedure (Ireland) Act provided that "the court shall direct that one or more medical men be sworn to inquire whether she be with child of a quick child"; if, after due inquiry, he or they report in the affirmative, "the court must stay execution till the woman is delivered of the child or until it is no longer possible in the course of nature that she shall be so delivered." Common sense might have suggested the application of some such machinery for the purposes of the new Act in England.

Cancer and Chiropractic Treatment.

An inquest was recently held at Bath upon the death of a retired Indian Army officer, aged 58, who had suffered from cancer of the prostate. Dr. Alister Sutherland gave evidence that the state of cancer was inoperable when first seen and that life could no have been prolonged for more than six months o a year. The deceased underwent chiropractic treatment in spite of Dr. Sutherland's warning that an severe manipulation of the spine would be dangerous he became rapidly and progressively worse after th treatment. An X ray photograph taken at an earli stage showed no evidence of spinal fracture or disease another taken after the chiropractic treatmen showed definite evidence of a fracture of the vertebr A woman chiropractor who had given the treatme stated that she had graduated in America in 1 and had practised in spinal work. She examin the deceased and picked out the vertebræ w were slightly out of alignment; these, she said, b pressing on the nerves, caused pain. It was he duty to get rid of this pressure and so relieve the pai It was not a severe treatment. Asked by the corone to describe it, she said it consisted of a little shor thrust; it was not a long manipulation. The deceased told Dr. Sutherland that the chiropractic treatment had relieved a certain number of his pains, and that as the doctors had no alternative to offer, he wa going on with it. He had told the chiropractor that he had been in the hands of the doctors and was getting steadily worse. He visited her three times she stated, and he said he was improved each time. A verdict was returned of death from cancer of the prostate gland accelerated by a fracture of the spine

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BERLIN.

(FROM OUR OWN CORRESPONDENT.)

THE GERMAN AERZTETAG.

THE Aerztevereins-Bund and the Hartmannbund, which are two distinct but closely associated bodies, have just held a joint annual meeting in Cologne. The importance of this year's meeting was emphasised by the fact that the Government was represented by the Minister of the Interior, Dr. Wirth. In his address he pointed out that owing to the financial stress it had been necessary to diminish the sum allocated in the national budget for social insurance.

This was unfortunately bound to affect the medical profession. The first subject of discussion at the meeting was the reform of the laws governing medical practice. The regulations relating to medical practice have since 1867 been included in the laws concerned with trades (Gewerbeordnung), and this connexion has been greatly resented by the profession. The discussion was opened by a lawyer, Prof. Ebermayer, formerly director of public prosecutions, who said the medical man was not in any sense a tradesman, but was an officer of public health. The conditions of medical practice differ in all respects from those of a trade. One of the provisions needing adjustment was that whereby a medical qualification could be withdrawn for good only if obtained in a fraudulent way and could be withdrawn temporarily only if a medical man had been found guilty of a crime and punished with a temporary loss of civic rights. The chairman, Dr. Stauder of Nürnberg, spoke on the future organisation of the profession. He looked forward to the time when the medical chambers, which are State organisations with disciplinary powers, would be brought into closer connexion with the voluntary organisations of the profession such as the Aerzteverein and the Hartmannbund. He protested against the last emergency ordinance whereby the profession was fettered in an intolerable way in its association with health insurance work and whereby the younger generation of medical men was excluded from that work for a considerable time after qualification. Other items discussed included the influence of unemployment on the public health in general, the reform of the insurance laws, and the question of post-graduate study. The meeting considered the use of asphyxiating substances and of bacteria in a future war and the protection of the population against such attacks. The Government was invited to take steps towards convening an international congress to stop the manufacture of such war materials.

DEATH OF PROF. MINKOWSKI.

Prof. Minkowski, one of the most celebrated physicians and pathologists of Germany, died in Wiesbaden on June 16th. Born in Kowno (Lithuania), in 1858, he became privat-docent in Königsberg at the age of 27 and six years later extraordinary professor in Strassburg. In 1900 he was appointed chief physician to the Cologne General Hospital and professor in the Academy of Medicine of that city, which has now become a faculty of the local university. Later he was appointed to the chair of medicine at Greifswald and then was invited to Breslau to succeed the late Prof. Strümpell. Prof. Minkowski's work was of fundamental importance, especially in connexion with diabetes. In 1884 he detected the presence of oxybutyric acid in the urine of diabetic patients, and formed the view that diabetic coma was due to an acid intoxication of the blood. He discovered later the part played by the pancreas in diabetes. Finding that after removing the pancreas of dogs sugar was present in their urine, he came to the conclusion that the pancreas must contain the substance necessary for the decomposition of carbohydrates and that its absence must thus lead to the excretion of sugar. His experiments thus formed the basis of the complex work on carbohydrate metabolism which eventually led to the discovery of insulin. Prof. Minkowski also worked on the pathology of gout, liver diseases, and diseases of the respiratory organs. During the war he turned his attention to the study of the morbid condition caused by gas poisoning. He had a large practice as a consultant in Breslau until he retired in 1926 to spend the rest of his life in Wiesbaden.

AN ACTION FOR UNFAIR COMPETITION.

Dr. Neustätter, the head of the anti-quackery department of the Dresden Exhibition of Hygiene held this summer, allowed the exhibition of a poster showing a man, who had run astray by following sign-posts leading to certain quack remedies, eventually finding his way back on to the road of scientific medicine. The producers of certain compounds mentioned in the picture brought an action against Dr. Neustätter before a court in Dresden for unfair competition and Dr. Neustätter was ordered to pay damages to the plaintiffs. In the judgment the court stated that Dr. Neustätter's picture was designed to induce patients to abstain from using the compounds mentioned instead of consulting qualified medical men and that the exhibition of the poster must thus be regarded as unfair competition. The Berlin Medical Society lately discussed the judgment. The chairman, Prof. Goldscheider, recalled the fact that 60 years ago the society had successfully petitioned for the abolition of the anti-quackery laws in the belief that the public was reasonable enough to decline to use quack medicines without legal restrictions being required. Its members had, however, been greatly disappointed. The Dresden judgment had proved this view to be untenable. The society finally adopted a motion that the exhibition of the poster was not inspired by commercial motives but by the wish to serve the public health. By wrongly interpreting the purposes of the exhibit the Dresden court had, it was felt, struck a blow against the honour of the profession. It was the duty of the profession to fight an unscientific outlook and attempts in this direction could not be regarded as unfair competition.

THE LÜBECK TRIAL.

The trial of the Lübeck medical men on a charge of manslaughter by negligence in the application of the Calmette treatment will take place in October. This is the biggest trial on record in Lübeck, since the public prosecutor is backed up by all the 250 parents of the children who died or were damaged in health after receiving treatment in the spring of 1930. A large number of witnesses will be summoned by the defence and by the prosecution, including Prof. Calmette, who has declared his readiness to appear before the court.

AN INTERESTING LAW-SUIT.

The question whether a medical man is entitled to charge for attendance on his wife was lately decided by the High Court in Leipzig. The wife of a medical man had been run down by a motor-car and severely injured. She was attended by her husband and in due course sent the owner of the car a note of her expenses, including accounts for medical attendance. The owner of the car declined to pay the doctor's bill, because he considered him obliged to attend members of his family free of charge. The High Court found against this view. In the judgment it was stated that one who has injured the health of a person cannot decline his financial responsibility under the pretext that the injured person had had no expenses because she was attended by her husband, who must be supposed to attend her free of charge. Such attendance not only requires time which the medical man might have spent on other patients, but also the use of medical instruments and of dressing materials. The defendant had thus to pay the sum charged by the medical man.

A NEW HOSPITAL IN BERLIN.

A new hospital, called the Martin Luther Hospital, was recently opened in Berlin. It has been erected information as to cases sent to the in-patient or out-patient departments of hospitals. But the criticism was based on a misunderstanding. The capitation fee to insurance practitioners included a payment for certain records to be kept by them. Until recently these records were two in number. Instead of requiring a daily record of visits and attendances for insured persons, as was kept by all English practitioners, the Department, after consultation with representatives of the British Medical Association, and with their concurrence, resolved to introduce a scheme whereby insurance practitioners would be given an opportunity of helping in clinical and administrative investigations. Their aim was to link up the insurance practitioner with research. The obligation to supply information in connexion with these investigations had taken the place of the obligation to send in annual summary cards. The insurance practitioners' part was to supply on a form a report on patients for whom they sought in-patient or out-patient treatment. He was satisfied that a doctor, even in a busy industrial area with a panel of 1500 persons, would not, on the average, require to send to the Department two reports a week. Surely it would be agreed that the insurance practitioners' part in this valuable investigation did not involve a serious encroachment on his time. Moreover, it was work undertaken as part of his agreement, and he was being paid for it.

Morbidity statistics had been collected for almost a year, and he said they hoped to publish a special report which would discuss more fully than had already been done some of the conclusions that might be drawn from the statistics. This would be the first report to be issued in this country dealing with sickness among the insured population. They had also nearly completed the first of what they hoped would be a series of investigations into the sickness experience of particular occupational groups of workers. Among other problems which had been already thrown up by the morbidity statistics he might cite the following: Why should a married woman require six days longer on an average than a single woman to recover from an illness? Why should the average duration of incapacity in the more isolated areas of the country be very much longer than it is in the more populous centres? What is the reason why, in one particular case of a fairly large panel, there should be a certification rate of 25 per cent. of the number of the panel during six months?

Mr. Jeffrey added that the increasing burden on women's funds had given rise to the greatest anxiety.

PUBLIC HEALTH SERVICES

REPORTS OF MEDICAL OFFICERS OF HEALTH.

THE following are 1930 statistics of one county and three county boroughs:—

Name of district and estimated mid-year population.	Birth-rate.	Death-rates per 1000 of the population.					Death-rates per 1000 births.		
		All causes.	Tuberculosis.	Cancer.	Respiratory diseases with influenza.	Heart disease.	Infant and neonatal mortality.	Young child (1–5 yr.) mortality.	Maternal mortality in childbirth.
Wiltshire .. (299,933)	15·2	11·3	0·61	1·66	0·9	2·6	51/—	—	3·2
Plymouth .. (199,000)	15·9	11·8	1·00	1·59	2·1	1·8	61/27	35	7·6
Sunderland.. (184,000)	23·1	13·5	1·36	1·14	2·7	2·0	78/34	41	3·8
Walsall .. (100,100)	20·6	11·2	1·11	1·14	1·8	2·1	69/35	20	5·3

Registered stillbirths per 100 live births:—Wiltshire 3·6, Plymouth, 5·3, Sunderland 4·0, Walsall, 3·3.

Wiltshire.

Dr. Claude E. Tangye states that the out-relief districts under the boards of guardians have been reduced in number by two. Formerly many of the applicants for relief called at the relieving officers' homes and there was one pay station at Swindon. Now payments of relief are made in the applicants' homes. The public assistance institutions for the chronic sick number 13, at three of which accommodation is provided for mental defectives, and at one of which there are wards for difficult male cases under male attendants. The services of consultants can be obtained both for institutional and home-treated cases. The hospital provision has been very fully used during the year and there is no serious shortage of general hospital beds apart from the Swindon area. The Pewsey poor-law institution is to form the nucleus of a mental deficiency colony with accommodation, ultimately, for 600. Notice has been received from outside authorities that the cases accommodated outside the county can be no longer retained. At present there are 84 males and 108 females in outside institutions. Since the Housing (Rural Workers) Act came into operation in January, 1927, 181 applications for grants or loans have been received by the county council, 31 of which were made during 1930. At the end of 1930, £6452 had been paid in respect of 77 houses, and work on 25 other houses had been begun. The Housing Act of 1930 puts new duties on the county council, and every rural district council must furnish information on overcrowding and unsatisfactory conditions, and the steps being tak to ascertain them. Dr. Tangye regrets that so far very few rural district councils have furnished this information. The Act enables the county council to make contributions to rural district councils for housing the agricultural population.

Outside Swindon the urban areas in the county retain their character of country towns and social conditions, and occupations are favourable to health. The district nursing associations cover the county area almost completely, and the county council, under the new Local Government Act, contribute towards midwifery, maternity nursing, and health visiting carried out by these associations. The handy woman has practically disappeared and almost all confinements are attended by midwives, either as such, or as maternity nurses. The standard of antenatal work carried out by midwives has shown a decided improvement, and the county council have approved a scheme for antenatal supervision by the family doctor, who is to attend the confinement. There are five maternity homes used by the county council, the total admissions to which were 741. The net cost to the county council for the 253 cases sent in by them was £2 2*s*. 6*d*. per patient.

Hitherto the inspection of dairy herds has been confined to the follow-up of tuberculous milk samples complained of by outside authorities, but on Oct. 1st the part-time veterinary inspector, Mr. S. V. Galledge, was appointed on a full-time basis, and Dr. Tangye points out that systematic inspection of all dairy cows must be the eventual aim in this great dairy-farming county. An outbreak of trichiniasis associated with the consumption of uncooked pork in potted meat from a meat factory accounted for seven cases of acute illness. The patients all recovered, though some were gravely ill. Two cases of fatal septic poisoning occurred at a dairy farm; both men were milkers. The first patient infected the teats of two cows and the second patient received the infection by milking these cows. The organism was a hæmolytic streptococcus. No harm resulted from the use of the milk, for it was sterilised at a factory.

Dr. Tangye wishes to see hospital treatment provided for measles and whooping-cough, with their high pneumonia fatality, rather than for the comparatively mild scarlet fever.

Plymouth.

Dr. A. T. Nankivell's report shows that Plymouth has in hand a big scheme of hospital reorganisation. There are three voluntary general hospitals with 240, 60, and 50 beds, respectively, and an eye infirmary with 28 beds. One of these general hospitals has recently absorbed the Eye, Nose and Throat Hospital and a scheme is in hand for the amalgamation of the three general hospitals, which will render classification of patients possible and, incidentally, facilitate negotiations between the voluntary and the municipal hospitals. Dr. Nankivell points out that there is no hard-and-fast line now between voluntary and municipal hospitals, and he hopes that the vague phrase "the Voluntary System," will not prove a formidable barrier in these negotiations for complete coöperation. In April, 1930, the municipality took over the three workhouses of the three towns. These were mixed workhouses of the old type. One of them—the Greenbank poor-law institution—has been transferred to the health committee and is to be converted into an up-to-date hospital. A medical superintendent and a complete visiting staff, paid by fees for services rendered (except in the case of the physicians), has been appointed. Before April last Greenbank was a workhouse holding 200 sick and infirm and a like number of able-bodied and lunatics; also some tramps, test workers, and all the mixture of the old workhouse. The able-bodied were transferred to the Devonport institution under the public assistance committee. The lunatics were sent either to Devonport or to the asylum, the tramps to the Stonehouse workhouse, and the children were passed over to the maternity and child welfare committee or the education committee; and during April all the poor-law sick from Stonehouse and Devonport were taken to this new city hospital. The buildings of the hospital were in a bad state of repair, and at the end of 1930 renovation was about half finished and accommodation for 550 patients available. Dr. Nankivell gives a graphic description of the want of equipment, human and otherwise, and of the wastage under the old régime. The central heating, at a cost of £4760 per annum, was doing very little work and most of the steam pipes leaked. During the last half of 1930 food cost £700 per annum less and the patients were better fed than ever before. The medical superintendent, Dr. Ivor Lewis, says there are now 23 maternity beds, and that it is hoped to develop antenatal work so as to form a consultative clinic for the practitioners and the maternity and child welfare officers. For this purpose out-patient accommodation is required. Medical out-relief under the old poor-law, which was working well, has come under the control of the health department. The principal change made is that the nine part-time practitioners are being asked to give prescriptions as under the National Health Insurance Act. The former dispensary has been closed and the new scheme has worked well since September.

Other municipal hospital developments are: Swilly Hospital, at present used mainly for tuberculosis, has been greatly extended at a cost of £47,000 and will be open during the current year as the isolation hospital; Mountgold Hospital, at present used for scarlet fever and diphtheria, will accommodate intermediate and advanced cases of pulmonary tuberculosis in men and women; on the high ground adjacent to Mountgold Hospital an orthopædic hospital is to be built to accommodate 120 patients; while Udal Torre Sanatorium, at Yelverton, an unsuitable building, is to be closed.

Dr. Nankivell complains of the slow progress made with slum clearance. Five years ago three slum areas were scheduled, and the city council readily agreed to their reconstruction. These areas should have been cleared three years ago, but nothing except some reconditioning has been done. There are other insanitary areas which need to be dealt with. During the next five years 2232 new houses should be built, and of these 1000 should be built as soon as possible. The lack of suitable sites retards progress in housing, and Dr. Nankivell thinks lofty blocks of modern flats on some of the insanitary areas in Stonehouse might be a desirable way of meeting the difficulty.

Sunderland.

Dr. A.S. Hebblethwaite states that on April 1st, 1930, Highfield poor-law institution was handed over to the public assistance committee, and that it has since been arranged that on April 1st, 1931, the medical, surgical, maternity, tuberculosis, and isolation wards and the nurses' home will be constituted a municipal hospital under the health committee. No changes have been made in the poor-law medical out-relief districts since their transference.

There are about 30,000 houses in the borough and 3600 people waiting for corporation houses. It is pointed out that the number on this list is not necessarily proof of great shortage, many applications being from persons who merely desire a change. The houses built during the year numbered 756, as compared with 410 in 1929. An increasing number of houses is being dealt with under Section 3 of the Act of 1925 and Section 17 of the Act of 1930. In 1928, 126 of these were renovated by the owner and 28 by the municipality in his default. In 1929 the figures were 317 and 55, and in 1930 647 and 44. The owners therefore show a decidedly increasing inclination to carry out the repairs themselves. The five-year housing programme puts forward ten clearance areas, involving 653 dwelling-houses and 6646 persons. The municipality expects to build 3000 new houses, of which 1000 will be needed to accommodate the population of the ten clearance areas and of additional individual houses to be demolished. The tuberculosis death-rate was exceptional in 1930 in that there were more deaths from non-pulmonary than from pulmonary tuberculosis, and Dr. Hebblethwaite points out that during the last five years there has been a definite decrease in tuberculosis of the lungs, but a definite increase in tuberculosis of the glands, bones, and joints. Dr. Eustace Thorp, who is in charge of the isolation hospital, expresses the opinion that the standard of the State examinations for nurses is far too high and covers too wide a scope. The long distances which nurses have to travel for their oral examinations is another matter requiring remedy.

Dr. Hebblethwaite advocates that general practitioners should have the use of the municipal antenatal clinics and staff at special sessions in order that the antenatal examination and the confinement may be conducted by the same person.

Walsall.

Dr. James A. M. Clark reports that the Manor Hospital and Beacon Lodge (poor-law), being a combined institution, has been placed under the control of the public assistance committee. The hospital contains 300 beds and the medical officer in charge reports that the work greatly increased during the year. For example, surgical operations numbered 85 in 1927, 369 in 1929, and 819 in 1930. The wards are now quite full and extensions are necessary.

The shortage in hospital beds in the borough appears to be general. The new isolation hospital, opened in April, provides only 34 beds. A slight outbreak of diphtheria in the second quarter was sufficient to show the inadequacy, and at the present time proposals for an additional ward block of 24 beds and a block for tuberculosis are before the council. The new maternity hospital, opened in July, 1929, with 11 beds, has proved so popular that many applications had to be refused. Since this hospital was opened antenatal work at the clinics has shown a great increase.

There is a considerable amount of overcrowding, and the corporation propose to build 4000 houses during the next five years, besides houses for rehousing tenants from clearance areas. There are about 2000 small houses built about 60 to 100 years ago, many of which show extensive deterioration. One unhealthy area containing 177 houses, occupied by 935 persons, was represented at the end of the year, and inspections are proceeding with a view to the representation of other areas. About a quarter of the houses are supplied by outside standpipes, serving from two up to 12 houses. Of 16,956 water-closets, 5817 have no flushing cistern and have to be flushed from a bucket or other receptacle. These are being dealt with under Section 36 of the Public Health Act, 1875. By-laws for houses let in lodgings were approved in June and the Walsall Act of 1930 prohibits any tent, van, shed, &c., for human habitation to be placed on any site within the borough without the previous approval of the corporation.

INFECTIOUS DISEASE

IN ENGLAND AND WALES DURING THE WEEK ENDED JULY 4TH, 1931.

Notifications.—The following cases of infectious disease were notified during the week:—Small-pox, 56; scarlet fever, 1442; diphtheria, 893; enteric fever, 63; pneumonia, 540; puerperal fever, 51; puerperal pyrexia, 100; cerebro-spinal fever, 39; acute poliomyelitis, 4; acute polio-encephalitis, 1; encephalitis lethargica, 24; dysentery, 13; and ophthalmia neonatorum, 107. No case of cholera, plague, or typhus fever was notified during the week.

The number of cases in the Infectious Hospitals of the London County Council on July 7th–8th was as follows:—Small-pox, 97 under treatment, 1 under observation (last week 124 and 1 respectively); scarlet fever, 1111; diphtheria, 1433; enteric fever, 15; measles, 143; whooping-cough, 449; puerperal fever, 35 (plus 10 babies); encephalitis lethargica, 208; poliomyelitis, 2; "other diseases," 141. At St. Margaret's Hospital there were 11 babies (plus 3 mothers) with ophthalmia neonatorum.

Deaths.—In the aggregate of great towns, including London, there was 1 (0) death from small-pox, 3 (0) from enteric fever, 16 (0) from measles, 3 (1) from scarlet fever, 21 (4) from whooping-cough, 23 (3) from diphtheria, 31 (7) from diarrhœa and enteritis under two years, and 19 (1) from influenza. The figures in parenthesis are those for London itself.

Three deaths from meningococcal meningitis were reported from London, all in children below five years of age. Three deaths from measles were notified in Leeds, while in Liverpool there were five deaths from whooping-cough, five from diphtheria, and three from diarrhœa and enteritis under two years.

The number of stillbirths notified during the week was 283 (corresponding to a rate of 42 per thousand births), including 46 in London.

DEATH CLASSIFIED TO SMALL-POX.

THE death from small-pox was assigned to Burton-upon-Trent. Dr. J. M. Cowie, the medical officer of health, kindly gives us the following particulars:—"The death certificate was signed as due to 'Variola.' The age of the patient was 75 years. He was probably vaccinated in infancy, but it was impossible to identify with certainty any vaccination marks. The case was a severe one, being of a confluent or semi-confluent character."

OBITUARY

SIR CHARLES HENRY BEDFORD, M.D., D.Sc., LL.D. Edin., I.M.S.

Lieut.-Colonel Sir Charles Bedford, who died on July 8th after a short illness, was the son of Dr. F. W. Bedford, headmaster of George Heriot's Hospital, Edinburgh. He wrote a biography of his father, and a history of the hospital, later advancing its interests in every way he could. A student of Edinburgh University, he graduated in medicine in 1887, in science in 1889, and after a couple of years in general practice joined the Indian Medical Service in 1889, He became professor of chemistry at Lahore and Calcutta, wrote "A Clinical Handbook of Urine Analysis" and a "Practical Chemistry" (their second editions being translated into French, Italian, and German), and became director of the Central Excise Laboratory for India and scientific adviser to the Government of India. He showed the Government that their standards for the taxation of alcoholic liquors were mistaken, recalculated the tables of alcoholic strength and specific gravities, and is said to have saved the revenue a million a year; he also edited for a time the *Indian Medical Gazette.* On retiring in 1911 he received a knighthood. The honorary degree of Doctor of Laws was conferred on him at St. Andrews in 1913, at Edinburgh in 1923, and at Oxford in 1924. During the war he acted as a regional chief commissioner of medical services; he was the first general manager of the Association of British Chemical Manufacturers, and hon. adviser to the Secretary of State for the Colonies on power and industrial alcohol. Later he did a great deal to encourage the foundation of the chair of Spanish studies at Oxford, and was director of the Anglo-Spanish and Spanish-American Institute of Lond He was a Knight Grand Cross of the Order of Ci Merit. Sir Charles Bedford was twice married, leaves no children.

ARTHUR MUSSEN, M.D. Q.U.I.

WE regret to announce the death of Dr. Arthur Mussen, at Templepatrick, in Northern Ireland, on July 3rd. Born at Hillhall, Lisburn, in 1842, he received his medical training in the Queen's College, Belfast, and graduated M.D. of the old Queen's University of Ireland in 1863. He also qualified as M.R.C.S.Eng., and was a licentiate of the Faculty of Physicians and Surgeons of Glasgow. He was one of the last surviving doctors in Ireland to have served a term of apprenticeship with a medical man in practice during his collegiate career. In 1865 he was appointed medical officer of the Glenavy dispensary district, and in that capacity discharged his duties with a faithfulness which gained for him the affection of the countryside. For 51 years he held the post of coroner for South Antrim, and was a Justice of the Peace for County Antrim. Dr. Mussen was prominently identified with the Orange Order, and for 57 years was District Master.

DAVID SOMERVILLE DOUGHTY, M.D. Edin.

Dr. Doughty, who died at Dalston, on July 10th, was born at Thornhill, Dumfries, in 1863, educated at Hutton Hall in the same county, and became in due course a medical student at the University of Edinburgh. After graduating in 1886, he began his medical career as house surgeon to the Dumfries Infirmary, spent a year as an assistant in London, then practised for another year at Hesket Newmarket, in Cumberland. He eventually bought Sir Norman Walker's practice at Dalston, to which he was to devote the rest of his life. He retired from active work only a few weeks ago, owing to failing health. "Of Dr. Doughty, as a man and physician, it is difficult to speak too highly," writes a colleague. "He was the type of man eulogised by the Roman poet of old—'Integer vitæ scelerisque purus.' With a keen interest in his profession, and an abundant store of human sympathy, he was one of the finest specimens of the old-fashioned country doctor one could wish to meet. He had many and varied interests. He was not only a popular doctor; he was a keen follower of hounds, an ardent fisherman, and a first-class game shot. There was no project set on foot calculated to promote the happiness of his neighbours which had not his whole-hearted support. Amongst his other activities he was for many years chairman of the local panel committee of the National Insurance. The meetings of this body he conducted with rare acumen, while his genial good humour soon smoothed down any asperity arising in the course of the discussions."

Dr. Doughty was shortly to be presented with an illuminated address and a substantial testimonial from the people he had served for 42 years.

CORRESPONDENCE

RECOVERY FROM STREPTOCOCCAL SEPTICÆMIA.

To the Editor of THE LANCET.

SIR,—In their interesting report of a case in your last issue (p. 72) Dr. A. H. G. Burton and Dr. A. R. Balmain make certain references to a paper by myself and Dr. R. E. Smith (Guy's Hospital Reports, Jan., 1931) which, to give our findings their due, require expansion and explanation.

1. They state that out of 21 cases described by us only six recovered. They do not mention that these constituted a more serious group, including complicated cases (five of them already the victims of chronic disease) from hospital records, and that the parallel series from private practice showed a recovery-rate of six out of eight traced cases. In other words, there were 12 recoveries out of 29 cases in the whole series reported by us.

2. They state that we regard diarrhœa, albuminuria with red cells, rapidly progressive anæmia, and the smooth red desquamating tongue as diagnostic of a streptococcal infection with an hæmolytic strain, but that these symptoms were lacking in their case. We believe that this is a valuable diagnostic syndrome, but we have not suggested that it is present in every case or with every strain. They also emphasise the absence of rigor in their case. This symptom, so commonly regarded as of outstanding diagnostic importance in septicæmic states, was rare in our hospital series.

3. Although our results with serum treatment were, on a critical analysis, disappointing, we do not altogether condemn the method. Furthermore, we make a special point of suggesting the trial of various brands of serum, which Drs. Burton and Balmain also claim as reasonable and as having contributed to the recovery of their patient.

The real difficulty in these streptococcal fevers is to decide whether recovery has been *post* or *propter* the serum therapy. The most anxious cases may recover without serum therapy or many weeks after ineffectual serum therapy and in spite of serious complications such as Drs. Burton and Balmain describe. It is highly probable that the use of other types of sera was a factor in the recovery of their patient, but there is nothing conclusively in support of this in their clinical report as presented. One of our most striking recoveries followed treatment with combined polyvalent serum and scarlatinal antitoxin, but I should hesitate to claim that the recovery was directly due to it or that it could not have occurred without it.

I am in entire agreement with their plea for early blood-culture and for a fuller trial of treatment with various types of concentrated serum, but if we are really to advance our knowledge of serum therapy in acute bacterial diseases such as septicæmia and lobar pneumonia, the most careful study of the natural history and course and of the variable mortality of these diseases, and the most critical analysis of case-reports are necessary. Better standards for distinguishing between *post* and *propter* effects must also be evolved. I am, Sir, yours faithfully,

J. A. RYLE.

Wimpole-street, W., July 11th, 1931.

MORTALITY AFTER PROSTATE OPERATIONS.

To the Editor of THE LANCET.

SIR,—Dr. Minnitt comments on the rise of the blood-urea figure following ether anæsthesia, and apparently concludes that it is an important factor in the mortality after prostatectomy, and that for this operation spinal anæsthesia should be substituted. He quotes an operative mortality of 50 per cent., which is greatly in excess of that obtained from any other source.

In his Lettsomian lectures, Sir John Thomson-Walker gave statistics from 11 general hospitals, in which the total mortality in 3451 cases was 19·5 per cent. The mortality at St. Peter's Hospital from 1901 to the end of 1929 was 9·9 per cent. in 2691 cases. For 1930 it was 7 per cent. It is only natural to suppose that a considerable number of these patients were operated on under inhalation anæsthesia (this is certainly true for the cases in St. Peter's Hospital), and I feel that ether cannot be blamed entirely for the mortality Dr. Minnitt encountered.

I have operated on almost 900 cases of enlarged prostate; about a third of them were given spinal, and the remainder inhalation anæsthesia. There was practically no difference in the mortality-rate of the two series, it fact it was a little higher when I used spinal anæsthesia. Before the war I employed this method in about 90 per cent. of my cases, but I gradually gave it up, and for the last eight years I have only used it occasionally. Spinal anæsthesia is ideal from the surgeon's point of view. It gives complete relaxation, and makes the operation easier than any other form of anæsthetic, but it has certain disadvantages for the patient. The most important of these is the fall of blood pressure. The average fall is about 30 mm. of mercury. With the addition of ephedrine the fall was about 15 mm., while when ether or gas-and-oxygen was used the blood pressure at the end of the operation was approximately the same as that before induction. This fall in blood pressure seriously diminishes the urinary excretion during the first 24 hours after operation, and it increases the risk of reactionary hæmorrhage.

My impression is that the mortality after prostatectomy depends more on the pre- and post-operative treatment of the patient than on any other factor. Most of the deaths ascribed to "uræmia" or "renal failure" are really due to post-operative pyelonephritis, which may not give rise to symptoms. Post-mortem records show that the kidneys are infected in most cases of post-operative "uræmia."

I have looked up the records of the last 150 cases I operated on in private. There were 5 deaths, 3·3 per cent. All these patients had inhalation anæsthesia. In 15 of them the operation took place in the country, the after-treatment being left to the local doctor; the remaining 135 were operated on in London, and remained under my care during their convalescence. There were two deaths among the country cases, 13·3 per cent., and three among those operated on in London—2·2 per cent. The operation was identical throughout, so the difference in the death-rate must be put down to the post-operative management. I am, Sir, yours faithfully;

Harley-street, W., July 11th, 1931. J. SWIFT JOLY.

CANE AND BEET SUGAR.

To the Editor of THE LANCET.

SIR,—In 1914 a small book was published on "Heart Disease and Cane Sugar," by the late Dr. A. Goulston, and there was some correspondence on the subject, mostly confirmatory of the author's conclusions, in the medical journals. Briefly, he stated, and supported his arguments by numerous cases, that he had found extra sugar alimentation to the amount of not less than 2 oz. and up to 6 oz. of *cane* sugar daily of very great value in the treatment of failing hearts. His first paper was published in 1911, and some of the cases he quotes are from other practitioners who, as a result of this paper, had tried the sugar treatment with excellent results. I myself tried it both in hospital and private practice, with considerable benefit to the patients, but the advent of the war, and the difficulty of obtaining sugar, made it impossible to carry it on, and later it had almost passed out of my mind.

The author insisted that the results were only to be obtained with *cane* sugar, not with beet, and gives two cases to support this point. To many, in those days, it seemed absurd that there should be any difference in the results given by two substances of identical chemical composition, but to-day our outlook is wider, and we are bound to admit that there may be bodies indefinable by chemical analysis, but of vital importance to the organism, in substances of identical composition but of different origin. The conditions under which cane and beet sugar, respectively, are produced—climate, soil, mean temperature, insolation, irradiation—differ enormously; it is reasonable to suppose that they may, therefore, have different physiological values. If they have, it is really of very great importance that we should know the facts.

As regards the heart, I venture to suggest that these could be determined by careful perfusion experiments.

At the present moment the English nation is engaged in the task of helping to destroy the colonial sugar industry by subsidising beet sugar in the interests of our own decaying agriculture. With the decline of Demarara and the West Indian plantations now rapidly progressing, it seems inevitable that the amount of beet sugar consumed here must increase. Doctors are not concerned with the question whether this demonstration of the difficulties of Imperial Preference is economically sound or unsound, but they should certainly know which of the two forms, in which one of our principal foods is taken by every man, woman, and child in these islands, has the better physiological value, if there be any difference between them. I submit that this might well be a subject of inquiry by the Food Investigation Board, the last number of whose Transactions rather suggests that in the future the coöperation of the biochemist (animal) and the biochemist (vegetable) in problems of this kind may produce valuable results.

I am, Sir, yours faithfully,

Wimbledon, July 6th, 1931. E. HOBHOUSE.

ACUTE RHEUMATISM FOLLOWING TONSILLITIS.

To the Editor of THE LANCET.

SIR,—The valuable paper by Dr. Sheldon and the interesting correspondence following it prompts me to draw attention to statements which occur in a paper which appeared in the *Medical Press and Circular* (1930, cxxx., 7), which I think bear on the subject in a way that may be useful to the discussion. In that paper I pointed out that all cases of throat inflammation are accompanied by some disorder of the heart, and further on stated: "In connection with an epidemic of the 'common cold' one knows that the throat inflammation has a tendency to clear up altogether, and no doubt the heart disturbance also disappears, but we all know that in some cases the throat condition may become subacute or chronic, and we ought also to know to what extent there is some residual disturbance of the heart. This linking up of throat and heart disturbances as part of one systematic serous disturbance is important for the point of view of ætiology, because it helps us realise that in both cases the exudative processes are upset."

Personally, I believe that acute rheumatism is due to a protozoon, of which the Aschoff body is the encysted form, and in the "acid children" who are predisposed to this disease the throat inflammation gives rise to a blood pressure conducive to the active generation of the protozoon. In all acute cases of acute rheumatism it will be found that the basic blood pressure is raised considerably before an attack, and with the return of temperature to normal the basic blood pressure becomes normal.

I am, Sir, yours faithfully,

Swansea, July 14th, 1931. G. ARBOUR STEPHENS.

MILLER GENERAL HOSPITAL.—According to the report for 1930 there has been a great improvement in the financial position as compared with 1920, when there was "a very real fear that part of the hospital would have to be closed." The building debt of £17,850 is being reduced by the interest from the gift of £20,000 from an anonymous donor to the King's Fund for the reduction of capital charges on voluntary hospitals in the boroughs of Deptford, Greenwich, Lewisham, and Woolwich. Last year there were 2140 new in-patients, a slight fall, explained by a small rise in the average number of days' stay (to 23·44 from 22·93), and to the children's ward having had to be closed twice owing to outbreaks of scarlet fever. The average weekly cost was £3 6*s.* 11*d.* At 30,123 the new out-patients showed a reduction of 1000, which was the more welcome owing to the inadequacy of this department. The old Congregational church which was converted into a temporary out-patient department ten years ago is showing signs of serious structural defects. A new building has therefore become an acute need. A coal-cellar is being used to provide additional accommodation for the X ray department.

BEIT MEMORIAL FELLOWSHIPS.

ANNUAL REPORT.

At a meeting of the Beit Memorial Fellowship, held on July 14th, the annual report for 1930 of the hon. secretary, Prof. T. R. Elliot, F.R.S., was adopted. The death, on Dec. 8th, 1930, of the founder of the Trust, was a great loss, for besides endowing the Trust with £210,000 in memory of his brother, Mr. Alfred Beit, Sir Otto Beit had devoted close thought to the advancement of the aims of the Foundation, and had shown the keenest pleasure in marking the successes in the advance of medicine by research which had been achieved by the most distinguished of the Beit Fellows.

On the expiration of his appointment as director of the Lister Institute, Sir Charles Martin, F R.S., had resigned from the Advisory Board of the Foundation after 21 years of loyal service. His resignation was deeply regretted, more especially since out of the 137 Fellows who had been elected since 1909 no fewer than 31 were assigned to work at the Lister Institute under his general direction, the Institute providing all laboratory facilities.

Sir James Kingston Fowler had resigned from the routine duties of honorary secretary, but the Foundation would retain his services as senior trustee; Sir James Kingston Fowler had been associated with the Foundation even before its inception, since he had taken part in the original discussions with regard to the contemplated benefaction and he had fostered each year's work with unremitting care.

The new appointments recorded were as follows:—Trustees: Sir John Rose Bradford, F.R.S., and Sir Alfred Beit. Advisory Board: Prof. J. C. G. Ledingham, F.R.S., and Dr. P. P. Laidlaw, F.R.S.

The number of Fellows at present working on the Foundation, excluding those reported for election now, is 23. The list of places recognised for research has long been widening, and each year more and more Fellows are being permitted, for special purposes, to work for a year abroad. The Fellows elected choose their own problems for research. The report calls attention to the fluctuations in the subjects proposed year by year, and to the rapidity with which the tide of research "swings first into one bay and then to another, in the pressure to find through allied sciences the means towards fresh advances in medicine. Bacteriology, for example, has so altered its landward approaches that among the present Fellows and the 39 candidates at this July election only a very few are content to attack the problems of microbic disease by the older charted ways. More of the voyagers now are exploring the coasts of biochemistry, and through fundamental studies, by precise test-tube experiments on the metabolic activities of bacteria, or on the modes of ferment action, are seeking to understand their behaviour in the human body. Indeed, for these and like aims, there are of the present Fellows seven now clustered in the biochemical laboratories of Cambridge University."

ELECTION TO FELLOWSHIPS.

The following new Fellows were elected:—

Senior Fellowships (value £700 per annum).

F. R. Winton, M.A., M.D. Camb. To continue his work in the Pharmacological Laboratory of University College, London, on the tonus of plain muscle, on the blood pressure in the glomerulus of the kidney, and on the effect of drugs on kidney secretion.

Fourth Year Fellowships (value £500 per annum).

B. H. C. Matthews, M.A. Camb. To continue his work in the Physiological Laboratory, University of Cambridge, on the analysis of sensory nerve impulses by electrical records obtained with the delicate oscillograph which he has invented.

Junior Fellowships (value £400 per annum).

Benjamin Stanley Platt, M.B., M.Sc., Ph.D. Leeds. Re-elected to the Junior Fellowship which he had resigned in 1926 in order to obtain medical qualification and so fit himself more fully for medical research. He will work at the School of Medicine, Leeds, on problems of the alimentary canal.

William Albert Hugh Rushton, Ph.D. Camb. Proposed research: On the chronaxie of nerve and muscle. Place of research: Physiological Laboratory, Cambridge.

Leonard Hubert Stickland, B.A. Camb., 1928. Proposed research: An investigation of the metabolism of the anaerobic bacteria associated with gas gangrene. Place of research: Sir William Dunn Institute of Biochemistry, Cambridge.

Muriel Elaine Robinson, Nat. Sci. Tripos, First Class in Parts I. and II. (Physiology), 1922. Proposed research: To continue investigations on hæmoglobin; and on the preparation of proteins in a pure state. Place of research: Sir William Dunn Institute of Biochemistry, Cambridge.

Frank Burnet Byrom, M.D. Lond., 1920; M.R.C.P., 1926. Proposed research: A study of factors influencing the total water exchange of the human body in health and in disease (in continuation of work begun at Chicago as Rockefeller Fellow). Place of research: The London Hospital.

Janet Maria Vaughan, D.M. (Oxf.), 1930. Proposed research: An investigation of the relationship of disordered hæmotopœisis to those bone changes that are found in human disease or which can be experimentally produced in animals. Place of research: Institute of Pathology, London Hospital.

Dr. C. H. Lambie, who held a Fellowship from 1923 to 1926, has been appointed to a new whole-time Chair of Medicine at the University of Sydney, New South Wales. Dr. D. Keilin, F.R.S., has been chosen for the Directorship of the Institute for Parasitology at Cambridge, to which he was first appointed to work as Junior Beit Fellow in 1920, and where he remained for a total period of seven years' research as Junior and Senior Fellow.

All correspondence of Fellows and candidates should be addressed to the Honorary Secretary, Beit Memorial Fellowships, University College Hospital Medical School, University-street, London, W.C.1.

Sheffield Royal Infirmary.—The governors are seriously considering the difficult pecuniary position of this hospital. Last year there was an adverse balance of £11,000, and during the first half of the present year the hospital is worse off than in 1930 by £3250. Should the situation not improve it may be necessary to close 80 beds, but an increase in the rate of contributions under the penny-in-the-pound scheme is under consideration on the ground that it is offering greater benefits than it can afford.

Valencia Island Hospital.—The tiny hospital on Valencia Island, county Kerry, is one of the few Irish hospitals in a position to extend in recent years without the aid of the hospital sweepstakes. The island is a meteorological station, and a station of the Western Union Telegraph Co. The hospital's patients include fishermen and farmers along part of the mainland coast, as well as those living on the island itself, and also the crews of trawlers and cable boats. Hitherto stretcher operation cases have been obliged to cross the ferry in an open boat to the mainland and to undertake a further journey of 40 miles to Tralee Hospital. There are days in winter when the ferry crossing cannot be made at all. The hospital contains eight beds in all; the largest wards for men and women holds three beds each, and there are sleeping quarters and a sitting-room for a resident matron. An operating theatre and an acetylene plant have now been added, and the hospital is about to be reopened. It is hoped that in the near future it will be possible to add a fever ward and a maternity ward—the latter, for very poor patients, is sorely needed. There is, however, a maternity and child welfare centre which is attended regularly by Dr. Elsie Murphy, the medical officer of health, and a nurse.

THE NATIONAL COLLECTION OF TYPE CULTURES.

EVEN the most superficial examination of the third edition[1] of the catalogue of the National Collection of Type Cultures, which has just been published, must impress the reader with the very considerable progress that has been made since the last edition[2] appeared in 1925. This collection, maintained by the Medical Research Council at the Lister Institute of Preventive Medicine, now comprises over 3000 different strains of micro-organisms of importance in human and veterinary pathology, plant pathology, agricultural and soil bacteriology, fermentation industries and also types useful for teaching purposes. The demand for cultures both at home and abroad has steadily increased, so that now considerably over 5000 cultures are distributed in each year to all parts of the Empire and beyond.

MICRO-ORGANISMS PATHOGENIC TO MAN.

A host of new types have been added to the collection in recent years. Among those of special concern in human pathology may be mentioned the extensive list of salmonella species, culturally similar but serologically distinct, that have been the subject of recent research by Bruce White, Schütze, Scott and others in this country. There has been acquired recently a valuable collection of pathogenic fungi belonging to the genera achorion, trichophyton, microsporon, actinomyces, madurella, sabouraudites, bodinea and others, including many types from the Sabouraud collection and also the isolations of Drs. Hare and Tate made during their researches on the fungi causing ringworm in children attending London County Council schools. Special mention may be made of *Actinomyces somaliensis* and *Madurella mycetomi,* which are associated respectively with white- or yellow-grained and black-grained "Madura Foot Disease" in the Egyptian Sudan (actinomycosis and maduromycosis of Chalmers and Archibald), the organism of "mossy foot" disease of the Amazon region (*Phialophora verrucosa*), the fungus of San Joaquin Valley Disease or coccidioidal granuloma (*Coccidioides immitis*), which has recently become a question of some concern to public health authorities in the New World, and *Scediosporium apiospermum,* the causal organism of a mycetoma in tropical South America and Southern Europe. Among the fungi may also be noticed *Penicillium notatum* Westling, a producer of "penicillin" and first used by Fleming in the elaboration of selective media for the isolation of Pfeiffer's influenza bacillus. A very fine selection of anaerobic bacteria, including the A and B types of *B. botulinus,* were presented to the collection by Prof. Ivan Hall in 1929. This also includes the interesting species *B. sordellii,* Hall and Scott, first isolated by Dr. Sordelli of Buenos Aires from lesions of malignant œdema combining the pathogenic properties of *B. novyi* (*B. œdematiens*) with some of the morphological and cultural characters of *B. sporogenes.*

The name "*B. indicus-ruber*" carries us at once back to the early days of bacteriology, and the catalogue reminds us that this strain, sent through the kindness of Dr. Robert Breed of the New York State Agricultural Experiment Station, was isolated from the alimentary canal of an ape in India by Robert Koch in 1884 during his researches into the ætiology of Asiatic cholera. But this is not by any means the *doyen,* so to speak, of the collection, for further on we find descendants of Duclaux's original isolations of "*Tyrothrix*" species from cantal cheese made in 1878, which were presented a few years ago by Dr. L. Rosenthal of the Pasteur Institute. Of interest also are the original isolations of *B. proteus* X 2 and X 19 made by Weil and Felix during their researches into the ætiology of typhus fever. Among the list of staphylococci one notices the Bundaberg strain of *Staphylococcus pyogenes,* isolated in connexion with the fatalities, still fresh in the memory, following the injection of toxin-antitoxin among children at Bundaberg, Queensland, and described in the report of the Royal Commission of Enquiry. Here also are Burnett's strains of the same organism, some of which are dependent on CO_2 for the production of toxin, while others produce toxin in its absence. Streptococci from scarlet fever are well represented, and include the original Dick strains (*Streptococcus scarlatinæ* I. and II.) used for the preparation of filtrates for use in the Dick intracutaneous test. Under streptococci may also be found specimens of the aerobic strains recently isolated from cases of puerperal sepsis, Birkhaug's non-methæmoglobi forming streptococci, and Small's strains of *Streptococ cardio-arthritidis* isolated from cases of rheuma fever. Under the genus neisseria (which also inclu the gonococcus and meningococcus) are listed strains of *Neisseria flavescens,* a new meningococcus-like organi isolated last year by Miss Sarah E. Branham of the U.S. Public Health Service from cases of epide meningitis. These organisms differ from the mening coccus in pigment production, lack of fermenta action and in antigenic relationship.

MICRO-ORGANISMS PATHOGENIC TO ANIMALS.

In the domain of veterinary science very extens additions have been made to the collection. T strains of *Actinobacillus lignieresi,* one of Engl and one of Swedish origin, are listed. These org isms were isolated from lesions of cattle su from actinobacillosis, a disease in many respec resembling actinomycosis caused by the true "ra fungus." One observes also *B. monocytogenes,* the causal agent of a peculiar disease of rodents associated with an absolute and relative increase of the mono nuclear leucocytes in the blood, isolated during a laboratory epizoötic at Cambridge in 1926 and described by Murray, Webb, and Swann. It is curious to note that a similar organism had been isolated the previous year from a South African gerbille, found dead and examined at the South African Institute of Medical Research by Major Harvey Pirie. Under the name *Bacillus welchii* are included two interesting sub-species. One of them, the bacillus of lamb dysentery isolated by Mr. T. Dalling, was presented by the Wellcome Physiological Research Laboratories; the other, isolated from lesions of sheep suffering from "struck" or "gangrene" was isolated by Mr. A. D. McEwen of the S.E. Agricultural College, Wye. One may regard these organisms as possibly separate and distinct species, but at any rate they are serologically distinct from *B. welchii* and from each other. Through the kindness of Lieut.-Col. Hamerton and Dr. Lovell, an interesting series of typical strains of "Morgan's No. 1 Bacillus" (*B. morgagnii*) has been made available. The organisms were isolated from cases of dysenteric colitis among animals at the Zoo, and came from such diverse sources as orang-outang, squirrel, and Abyssinian monkey, green-billed toucan, false moccasin, large-scaled mabma, and pine snake. *B. pseudotuberculosis-rodentium* is well represented, the collection containing a complete selection of Schütze's serological groups and types of these organisms. It is worthy of remark that this organism is non-motile when grown at 37° C. but is actively motile when grown at room temperature, the explanation being that the flagellated "H" form of the organism does not develop at the higher temperature, the non-flagellated "O" form only being present. A serological grouping is also presented by the genus pasteurella, which is here arranged according to the classification of Cornelius. Both with *B. pseudotuberculosis-rodentium* and with the pasteurella group there is no significant correlation between the species of the infected host and the serological type of the organism encountered.

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[1] Medical Research Council, Special Report Series, No 64, revised. H.M. Stationery Office. 1931. Pp. 112. Price 2s.

[2] See THE LANCET, 1925, ii., 1080 and 1096.

MICRO-ORGANISMS AFFECTING PLANTS.

Of less interest, perhaps, to medical men and veterinarians are the sections devoted to phytopathology and fermentology, but to many others these pages will appear the most attractive. This side of the collection is becoming of increasing importance, for a continuous attempt is being made to satisfy the requirements of mycologists and technical bacteriologists in this country and to make them independent of other sources of supply. Many hundreds of new fungi affecting plants, many of high economic importance, have been added to the collection during the past few years, and a glance at the descriptive list forming Part II. at the end of the catalogue will assure the reader of the importance attached to this aspect of the collection. Here are listed parasitic forms attacking fruit crops, cereals and vegetables, tropical produce and timber, including not only representatives of the higher fungi but also many species of phytopathogenic bacteria. The latter are often closely related, both morphologically and serologically, to various common saphrophytic forms—e.g., *B. fluorescens-liquefaciens* and *non-liquefaciens*—from which they probably derived. In most cases, however, a specific pathogenicity for their host plants is not to question.

BACTERIA OF GENERAL INTEREST.

Among organisms of general bacteriological interest may be mentioned the very complete collection of aerobic spore-bearing organisms (to which many systematists consider the generic name "bacillus" should be strictly confined) presented by Dr. W. W. Ford of Johns Hopkins University, whose researches, and those of his co-workers, have done so much to clarify the taxonomic position of this difficult group. Also worthy of mention are Gray and Thornton's collection of soil organisms concerned in the decomposition of certain aromatic compounds (phenol, meta-cresol, and naphthalene), which are used as soil sterilising agents. Pure cultures of these bacteria use these compounds as sole sources of energy in mineral salt media containing inorganic nitrogen. Many interesting types derived from bacterial disease of insects, both harmful and beneficial, are conserved. Typical of the former may be instanced the *Coccobacillus acridiorum* of d'Hérelle, associated with locust disease, and of the latter, *B. paratyphosus-alvei*, the cause of "paratyphoid" of the honey-bee.

PROTOZOA.

Among the protozoa are several species of leishmania, isolated recently in the Near East—*L. agamæ*, isolated from heart blood of grey lizard (*Agama stellio*), Lower Galilee; *L. ceramodactylæ*, isolated in Bagdad from gecko (*Ceramodactylus doriæ*); and *L. tarentolæ*, isolated in Tunis from a similar host. These interesting types were deposited in the collection by Dr. S. Adler of the Hebrew University, Jerusalem. Worthy of remark also are the herpetomonas species, isolated by Noguchi and Tilden from hemipterous insects, and the latex of the milk weed on which they feed, which were used in serological investigations of leishmania and allied species of protozoa.

NOMENCLATURE.

Mention should also be made of the appendix to the preface which contains the resolution of the International Society for Microbiology with regard to the composition and scope of the newly formed Nomenclature Committee of this Society, together with the complementary resolution of the Plenary Congress of the Fifth International Botanical Congress. It is hoped that under the guidance of an authoritative international committee, created in such favourable circumstances, substantial progress and agreement may soon be reached on many difficult questions of bacterial taxonomy and classification.

MEDICAL NEWS

University of Oxford.

The Theodore Williams scholarship in anatomy for 1931 has been awarded to J. W. A. Turner, of New College. The Master and Fellows of University College have awarded the Radcliffe scholarship in pharmacology to D. F. G. Moir, of Magdalen College.

University of London

At recent examinations the following candidates were successful:—

D.P.H.

Part I.—Katherine Barnett, H. L. W. Beach, T. C. Lonie, G. R. Marcano, S. M. Rafi, A. M. Samarasinghe, C. R. Selous Jones, S. P. Srivastava, and Sarah M. F. Walmsley.

Royal College of Surgeons of England.

A quarterly meeting of the Council was held on July 9th. Lord Moynihan was re-elected president, and Mr. R. P. Rowlands and Mr. W. Sampson Handley were elected vice-presidents. Sir Arthur Keith was reappointed conservator of the museum for a further period of five years. Mr. R. H. Burne (physiological curator), Mr. C. F. Beadles (pathological curator), Sir Frank Colyer (honorary curator of the odontological collection), and Mr. C. J. S. Thompson (honorary curator of the histological collection) were re-elected. The Hallett prize for anatomy and physiology was awarded to Mr. S. G. Clayton, of King's College. The second Macloghlin scholarship for medical students was awarded to Mr. R. Y. Stevenson, of Herbert Strutt School, Belper. Mr. E. G. Muir, F.R.C.S., of Middlesex Hospital, was reappointed Bernhard Baron scholar, and the College research scholarship was granted to Mr. L. F. O'Shaughnessy, F.R.C.S. The Fellowship was conferred on Mr. A. A. Davis (Manchester), and Mr. A. L. Light (Leeds and Middlesex). Membership of the College was conferred on Harbans Singh (Punjab and St. Bartholomew's).

Licences in Dental Surgery were conferred on the following:—

Benjamin Bane, N. F. Bunn, John Bunyan, E. L. Clark, Brian Connelly, L. H. G. Cummings, J. C. Dominick, G. T. C. F. du Plessis, T. A. A. Eaves, M. W. Ellwood, C. L. Endicott, R. L. Etheridge, D. W. Goodman, W. G. C. Hackman, L. P. Harte, W. U. Harwood, R. N. Hines, K. A. Johnson, S. J. G. Knott, G. S. Loader, W. P. McEldowney, Alan Mortimer, Leslie Mortimer, W. L. Mountain, R. H. G. Neave, P. E. Probert, M. A. Rahim, J. L. Roberts, H. S. R. Sarson, J. A. Sidebottom, W. M. Sinclair, J. W. Small, Mervyn Snipper, J. H. Stevens, P. J. Stoy, J. V. C. Sutton, Marius Taralrud, R. W. Tuck, D. J. Wandless, and W. J. Wheatley.

Diplomas in Public Health, Psychological Medicine, and Laryngology and Otology were granted jointly with the Royal College of Physicians.

The following professors, lecturers, and demonstrators were elected for the ensuing year:—

Hunterian Professors.—Sir Arthur Keith, six lectures on Recent Advances in Embryology applied to Surgical Problems; Mr. J. P. Hosford, one lecture on Some Factors in the Causation of Hydronephrosis; Mr. R. T. Payne, one lecture on Excretion Urography; Dr. A. Remington Hobbs, one lecture on the

Puerperal Uterus as a Surgical Problem; Dr. J. A. Ryle, one lecture on the Natural History of Duodenal Ulcer; Mr. H. A. Harris, two lectures on the Comparative Anatomical Aspect of Prenatal, Infantile, and Adult Disease in Man and Animals, with special reference to Bone Growth.

Arris and Gale Lecturers.—Prof. W. E. Le Gros Clark, two lectures on the Structure and Connexions of the Optic Thalamus; Mr. A. J. E. Cave, one lecture on the Morphological and Functional Anatomy of the Human Cervical Spine.

Erasmus Wilson Lecturers.—Mr. C. E. Shattock, Mr. C. P. G. Wakeley, Mr. R. Davies Colley, and Mr. E. D. Moir.

Arnott Demonstrator.—Sir Arthur Keith.

Thursday, Nov. 12th, was fixed as the date of the Buckston Browne annual dinner of Fellows and Members.

University of Sheffield.

At recent examinations the following candidates were successful:—

M.D.

E. S. Clayton and J. N. Gale.

FINAL EXAMINATION FOR M.B., CH.B.

* J. E. Edson, A. W. R. Eardley, T. A. Hunt, S. K. Pannikar, and D. R. Rigg.

* With Second-class Honours.

University of Aberdeen.

On July 7th the following degrees and diplomas were conferred:—

M.D.—*B. S. Cran, Peter Henderson, and W. J. Webster.

* Awarded Honours for Thesis.

M.B. and Ch.B.—† W. G. Davidson, † T. N. Morgan, Annie S. Bain, C. L. Barron, John Brennan, J. A. Cardno, Alexander Chalmers, J. W. M. Christie, W. A. Clarke, W. S. Davidson, E. H. W. Duncan, E. W. Duthie, F. M. Duthie, G. I. G. Findlay, W. M. Fotheringham, Winifred I. B. Gibb, William Harkins, D. A. Macdonald, H. E. T. McDonald, William Mackie, Elizabeth A. Marsden, Alexander Matheson, J. F. Mitchell, C. M. McQ. Murray, M. G. Murray, L. R. A. Ogg, A. A. Peat, C. D. Preston, Isobel S. W. Ramsay, W. S. Russell, P. C. B. Shirreffs, J. D. Trail, and James Webster.

† With Second-class Honours.

D.P.H.—R. G. Henderson, Roderick Mackay, William Stewart, and Robert Sutherland.

Queen's University of Belfast.

At a graduation ceremony on July 10th the honorary degree of Doctor of Science was conferred on Dame Louise McIlroy, professor of obstetrics and gynæcology in the University of London, and Mr. Joseph Barcroft, F.R.S., professor of physiology in the University of Cambridge. The following ordinary degrees and diplomas were conferred:—

M.D.—J. H. Biggart,* Jane L. McNeill,* A. J. P. Alexander,† Eric Blackstock, A. E. Campbell, Kirk Forsythe, and J. W. Kernohan.

* Gold medal. † Commendation.

M.B., B.Ch., B.A.O.—Second class honours: Lilian V. Reilly, F. J. Booth, J. B. McKinney, and G. A. W. Neill. Pass degree: F. W. Atkinson, Basil Blewitt, Douglas Boyd, E. C. J. Camps, E. M. Condy, D. H. Craig, J. A. Crockett, R. S. Cromie, W. B. Davis, Edward Davison, N. S. Dickson, Joseph Eidon, John Halliday, H. A. Hezlett, Robert Johnston, G. A. Kane, J. J. G. Kerr, J. R. McAdam, Rowan McCombe, Grace E. McConkey, R. M. McMinn, D. W. Macartney, J. A. Magee, H. L. Martin, J. T. Murphy, Howard Nelson, D. J. P. Parker, J. W. Patrick, T. E. Reade, A. G. Ross, R. O'N. Sloane, Raymond Smith, H. D. Sutherland, H. A. Taylor, Gerald Townsley, A. P. Trimble, and T. W. H. Weir.

D.P.H.—Samuel Anderson, J. L. Bradley, Kathleen M. Cathcart, J. A. Crawford, J. A. D. Deeny, P. H. Deeny, Campbell Gardner, Gertrude M. Glenn, T. S. S. Hall, F. F. Kane, J. M. McClenchan, W. C. MacFaul, J. A. MacHugh, B. L. MacQuillan, Grace K. Pollock, and George Smith.

B.D.S.—Lloyd Dornan.

L.D.S.—J. J. A. Bowe, R. G. Chambers, W. B. Forgrave, Sadie Gault, W. A. McClements, D. I. Malcolmson, J. W. Robinson, W. S. G. Rodgers, S. R. Sheane, R. S. L. Sloan, Agnes Smiley, and W. E. Smyth.

The Sinclair medal in surgery was awarded to W. S. Campbell, and the Symington medal in anatomy to W. M. Loughridge.

International Orthodontic Congress.

The second International Orthodontic Congress will be held at the Savoy Hotel, London, from July 20th to 24th, under the presidency of Dr. J. H. Badcock. On the first evening, after the presidential reception, Prof. Elliot Smith will give a popular lecture on Evolutionary Tendencies Affecting both the Teeth and the Jaws. On the following evening there will be a reception by the President and Council of the Royal College of Surgeons of England at the College. On Thursday, July 23rd, a banquet will be held at the Savoy Hotel.

Boston Surgical Society.

At a meeting of this society, on June 10th, the Bigelow medal for excellence in surgery was conferred on Mr. G. Grey Turner, professor of surgery in the University of Durham. In presenting the medal, Dr. F. B. Lund, the president, said that the previous recipients were Dr. W. J. Mayo (1921), Dr. W. W. Keen (1922), Dr. Rudolph Matas (1926), and Dr. Chevalier Jackson (1928). After the presentation Prof. Grey Turner delivered a lecture entitled Some Experiences in the Surgery of the Œsophagus.

University of Dublin.

At recent examinations in the School of Physic, Trinity College, the following candidates were successful:—

M.D.

T. C. Foster, Bernard Moshal, and Albert Sachs.

M.CH.

T. J. Millin and H. A. Brittain.

M.A.O.

W. S. Dickson.

FINAL EXAMINATION FOR M.B., B.CH., AND B.A.O. (PART II

Medicine.—*Brian O'Brien, G. A. Wray, T. M. R. Ahern, D. B. Bradshaw, H. V. Tighe, J. B. Fleming, H. F. G. Irwin, F. C. Jackson, M. G. Leane, I. G. M'Intyre, D. G. Kennedy, A. D. Barber, D. H. S. Boyd, W. A. Hill, T. J. O'Sullivan, J. C. M. Brambell, J. L. Martin, N. H. Leask, R. C. Sutton, H. S. Mason, E. F. Burton, and Joseph Elliman.

Surgery.—*Margaret D. Gregg, Elizabeth K. Roberts, Brian O'Brien, T. F. O'Donnell, Marjorie L. Campbell, T. M. R. Ahern, H. V. Tighe, Charles Ryan, J. C. M. Brambell, F. C. Jackson, Ruth R. Armstrong, A. A. Lisney, W. A. Hill, M. G. Leane, and N. H. Leask.

Midwifery.—A. A. Cunningham, J. A. Wallace, R. D. Scott, L. L. Nel, E. W. West, G. F. Harris, H. J. Garland, and Fran King.

* Passed on high marks.

D.P.H.

Part I.—Harry Nelson, G. C. Dockeray, L. L. Griffiths, W. Speedy, Nora A. Stack, R. St. J. Lyburn, Jane A. M. Na and C. P. Wallace.

Part II.—G. C. Dockeray, W. D. Speedy, Harry Nelson, a Nora A. Stack.

D.P.M.

Part II.—G. W. M. Scroope.

The Osler Club.

At a meeting of this Club, held in London on July 12th, t eighty-second anniversary of Osler's birthday, Dr. W. Stok the mayor of Oxford, delivered the fourth Oslerian Oratio entitled Osler and Tuberculosis. Dr. A. S. MacNa proposed, and Dr. A. P. Cawadias seconded, a vote thanks. An exhibition had been arranged of some of Osle writings on tuberculosis.

Medical Society of Individual Psychology.

The annual general meeting of this society, preceded a dinner, was held at the Florence Restaurant on July Dr. O. H. Woodcock, the out-going chairman, who presi said that the list of members had quadrupled during last nine months. Dr. W. Langdon-Brown was ele chairman for the ensuing session, with Dr. F. G. Crooksh as editor, and Dr. Hilda Weber assistant editor of the p cations. Dr. Redfern, Dr. Robb, and Dr. James were elected to the committee. Dr. T. E. Lawson (to w applications for membership and information should addressed at 11, Chandos-street, London, W. 1) re-elected hon. secretary and treasurer.

Royal Medico-Psychological Association.

The annual conference of this association was held l week in Dublin. The President, who was installed in of on the first day of the conference, was Mr. Richard Leeper, resident medical superintendent of St. Patric Hospital, Dublin. On July 7th Dr. Ariëns Kappers, Amsterdam, gave a lecture to the association on t Function of the Layers of the Cerebral Cortex. Seve other papers were read, among them being one by D Bethel Solomons on Insanity in Relation to the Parturie State; one by Dr. J. R. Lord on Somatic States in Ment Disorders; and one by Prof. W. Burridge (Lucknow) on t Mechanism of Personality. On July 8th the Governors St. Patrick's Hospital gave an afternoon reception to t members of the Association and a large number of oth guests. St. Patrick's Hospital is the oldest mental hospit in Ireland, and owes its foundation to Dean Swift, fro whom it is popularly known as Swift's Asylum. It st occupies the original building, though considerably moder ised. On the evening of the same day the Associatio held its annual dinner in the Hall of the Royal College Surgeons. On July 9th the members of the Associatio were entertained to lunch by Messrs. Arthur Guinnes Son & Co., and to dinner by the Strollers' Club. O the 10th the President of the Association and Mrs. Leep entertained a large company of friends at a garden part in the grounds of the Royal Zoological Society, and in th evening the Governor-General and Mrs. McNeill held reception at the Viceregal Lodge. On July 10th, after short business meeting, the members went for a moto tour through County Wicklow.

The King has given directions for the reappointment o Sir Hilarion Marcus Fernando, M.D. Lond., as a member o the Executive Council of the Island of Ceylon.

PARLIAMENTARY INTELLIGENCE

NOTES ON CURRENT TOPICS.

BILLS ADVANCED.

In the House of Lords on Wednesday, July 8th, the Royal Assent was given by Commission to a number of Acts, including the Sentence of Death (Expectant Mothers) Act; the Mauritius Loan (Guarantee) Act; the Ministry of Health Provisional Orders Confirmation (Manchester and South Staffordshire Joint Small-pox Hospital District) Act; and the Ministry of Health Provisional Order Confirmation (Aylesbury Joint Hospital District) Act.

HOUSING IN RURAL AREAS.

On July 10th, in the House of Commons, Mr. **Arthur Greenwood** (Minister of Health) moved the second reading of the Housing (Rural Authorities) Bill. He said that the scheme of the Bill was one to help necessitous rural district authorities. Clause 1 provided that only those rural districts would be eligible for assistance who could show that their financial resources were insufficient to enable them to make adequate housing provision. There were ample powers under the Housing Acts to deal with the recalcitrant or apathetic local authority. They were dealing with a clearly defined problem, that of the housing of the agricultural worker, and the people similarly circumstanced. The scheme was limited to the agricultural part of the rural districts as defined in the Housing Act, 1924. The scheme was to be worked through a special committee to be appointed shortly with the approval of the Treasury and a separate committee to be appointed by the Department of Health for Scotland. The committee would consider applications by local authorities and determine the number and kind of house in respect of which this additional assistance might be given. It would lay down the date by which the houses were to be completed, fix the rent at which the houses were to be let, and also fix the amount of the special al grant in respect of the houses which had been approved. It was necessary to establish a test of poverty for the areas which were to be assisted. It would be a double test—first, that the product of a 1*d*. rate was less than 5*d*. per head for the population, and, secondly, that the general district rate was more than 10*s*. in the £. The scheme was an emergency one, and the applications had to be in before the end of November. The assistance given under the Bill would be in the form of contributions payable annually for 40 years like the ordinary housing grant, and the county council contributions of £1 per house, permitted under the Housing Act, 1930, would be payable in respect of houses occupied by the agricultural population.

Sir **Kingsley Wood** criticised the Bill, which he said was an uninspiring, doubtful, minor, rather pathetic but typical contribution of the Government to the needs of the countryside.

HOUSING INFORMATION IN M.O.H. REPORTS.

After further debate,

Lieut.-Colonel **Fremantle** said there was a real danger in the precedent which this Bill would set. For the first time, instead of having a housing subsidy fixed by Parliament they were going to have a variable extra subsidy to be applied for certain very limited areas, which certainly were not most in need of housing reform, however much they were in need of housing improvement. The Conservative Party yielded to no one in their desire to improve housing conditions, and they welcomed any help given to the rural parishes. But it had been pointed out that the expense of this scheme would probably work out at something like £1000 a cottage in the long run. This tremendous expense, in order to build a few cottages, was not justified at the present time, however much it might have been justified in 1919–20. It was a mistake to suppose that because a house had been condemned as unfit for habitation it would never be fit for habitation. Medical officers of health—and he had been one of them—had always condemned houses where they were deficient in vital necessities, such as water-supply, sanitary accommodation, &c., but there were many old cottages that could be put right and made fit for habitation. It was for that reason that the Housing (Rural Workers) Act was passed, which had been found very useful when properly used. Provision was already made, quite apart from this Bill, for bringing pressure to bear on local authorities who did not do their work in connexion with housing or anything else, by the beneficent and far-sighted measure passed in 1929, which provided the only practical way by which local authorities could be dragooned—namely, by the pressure of the purse. It was felt that one great thing required in regard to housing was publicity regarding what was good and publicity regarding defects. It often happened that these things were not known. But there was one method which was always available to the Ministry of Health and to the public, and that was to make use of the annual reports of the medical officers of health. The Ministry could call for a definite survey of a particular area regarding housing, leaving aside for the time being the normal report on public health. He meant a survey by the medical officers of health, both in the districts and the counties. Such publicity would go a long way towards showing to all concerned what were the actual facts and needs.

The Bill was read a second time without a division.

UNHEALTHY DWELLINGS.

In the House of Lords on July 13th the Bishop of **Southwark** drew attention to the large number of persons who, in London and elsewhere, are now living in unhealthy underground dwellings, and asked for information as to the number of houses which the local authorities proposed to build in the next five years. He also asked if His Majesty's Government would appoint, in the interests of efficiency and economy, a central housing council to encourage and supervise the building of houses for the working classes; and he moved for papers. He said that the medical officer of health for the London County Council stated that there were about 30,000 basement dwellings in London which were unfit for human habitation, but in which 100,000 people were still living. Sudden and violent falls of rain flooded these basements; apart from that, they were always damp and dreadfully overcrowded. In some of the rooms four or five persons lived and slept. The results to health were deplorable. He was told that children who lived in basements were unhealthier than slum children. They suffered particularly from pneumonia and rheumatism. It was said that continued progress was being made in the closing of basements, but he found that in 1929 only 174 had been closed. In fact his information was that the occupation of basements was extending. He knew that in South London there were more basements in use now than there had been eight or nine years ago; and he was informed that this was happening all over London. The local authorities had power to close basements as sleeping places if they were proved to be unhealthy. Their powers should be extended to closing living-rooms in basements if unhealthy, as it was impossible by inspection to decide which rooms were used for living and which for sleeping. It was true that large numbers of the occupiers of these unhealthy dwellings did not desire to remove. That was due to some extent to the protection they received under the Rent Restriction Acts. Even for basements the rents were raised at once for new tenants. But his experience was that the majority of occupiers were anxious to remove if they could obtain better habitations. He asked the Government to urge local authorities to regard unhealthy basements as the first thing to be dealt with in their housing policy; to introduce legislation to strengthen the existing law, if it required to be strengthened, and to make inquiries and publish the results on the health of people living in basements.

DIFFICULTIES.

Lord JESSEL said that the local authorities in London fully sympathised with the views expressed by the Bishop of Southwark, but they realised that the question was surrounded by many difficulties. There was difficulty, for example, in condemning certain dwellings because they were not technically insanitary according to the law; and there was also the difficulty already referred to—namely, the tenants did not always wish to remove.

Lord BUCKMASTER said that if there were difficulties the local authorities ought to clear them out of the way; the difficulties, though grave, were not insuperable. What was the use of building new houses if the slum-dwellers could not afford to pay the rents? The slum problem would have to be approached on a far wider and broader basis than had yet been attempted. In that matter he was prepared to go any length, because he found it difficult to live easily when he contemplated the horrible conditions in which people had to live around him. It was perfectly clear that until the unrestricted birthrate could be controlled this problem would never be solved.

Lord DICKINSON said that according to the information at his disposal things were getting worse instead of better in this connexion. While the population of the County of London was decreasing the number of persons in the occupation of underground dwellings was increasing. The great difficulty was to offer the provision of alternative accommodation. He suggested that a definite survey should be made of basement dwellings, to be followed by a definite programme of providing alternative accommodation.

AGREEMENT IN PRINCIPLE.

Lord SNELL (Under Secretary for India) said that the Government were in complete agreement with the main principle of the Bishop of Southwark's speech. This was a problem of great urgency. He was advised that the powers possessed by the local authorities were adequate for dealing with it. Under the Slum Clearance Act of last year any part of a house, above or below ground, which was let separately could be closed for habitation if proved to be unhealthy. The local authorities must not be diverted from their systematic attack on bad housing conditions generally to one aspect of it alone; there was no short and easy solution along those lines. The great difficulty was to rehouse the people in the slums, and the closing of a basement did not provide a new site. The Housing Act of 1930 was an earnest of the Government's intentions to deal drastically with the whole problem of the slums. The outlook for building was not unpromising. Five years' building programmes had already been submitted by 280 local authorities, covering five-eighths of the population of England and Wales, who proposed to build 340,000 houses. The Government would not neglect to keep local authorities alive to their responsibilities in the matter, though they were aware that local authorities generally were generously responding to their appeal to make use of the new slum clearance powers and resources provided by the Act of 1930. In the opinion of the Government, the setting up of a central housing council suggested by the Bishop of Southwark would be unwise. The Government were watching the situation, and they believed that they were reducing the problem of slum clearance to manageable proportions, though much remained to be done.

The Bishop of Southwark withdrew his motion for paper

HOUSE OF COMMONS.

THURSDAY, JULY 9TH.

Maternal Mortality.

Dr. PHILLIPS asked the Minister of Health how many local authorities had now replied to his circular on maternal mortality, issued in December, 1930; how many of these proposed to make improvements in their services; which local authorities proposed to make no improvements; which local authorities had not yet replied; and what were the latest figures of maternal mortality in areas which made no proposals for improved services or had sent no replies to the circular.—Mr. GREENWOOD replied: The following is the information asked for: 139 local authorities have now replied to this circular, and of these 102 propose to make improvements in their maternity services, while 13 state that the circular is still under consideration. I am sending a further communication to those authorities who have not yet replied to the circular. The following authorities do not propose at present to extend their maternity services: Berks, Flintshire, and West Suffolk county councils; Chepping Wycombe, Colchester, Cowbridge, Eastbourne, Hereford, Hove, Lytham St. Anne's, Newcastle-upon-Tyne, Reading, Sutton Coldfield, Thornaby-on-Tees, and Wallsend borough councils; Kensington and Westminster metropolitan borough councils; Aberdare, Barking Town, Barry, Northfleet, Stone, and Tettenhall urban district councils and Tonbridge rural district council. As regards the la part of the question, the only available figures as to mater mortality are published in the Registrar-General's Statistic Review which gives the figures for each county and county borough.

Poor-law Relief.

Sir KINGSLEY WOOD asked the Minister of Health the number of persons in receipt of poor-law relief in Engla and Wales.—Mr. GREENWOOD replied: The total of persons in receipt of poor relief in England and Wal (excluding rate-aided patients in mental hospitals, casua and persons in receipt of domicilary medical relief only) o Saturday, June 6th, 1931, was 992,450.

Vaccination.

Mr. WINTERTON asked the Minister of Health, in vi of the recent cases of deaths and of blindness follow vaccination, whether he would consider the appointm of a representative committee of inquiry to inquire into whole subject and to report to Parliament.—Mr. GREENWO replied: The subject dealt with in my hon. friend's ques was fully investigated by the Committee on Vaccinat whose reports were issued in 1928 and 1930, and I do see the necessity for any further inquiry at the present

Mr. FREEMAN: Is the right hon. gentleman ab announce any decisions on the statement which he ma a year ago as to the whole administration of the Vaccinati Acts?

Mr. GREENWOOD: No, I cannot.

Mr. WINTERTON asked the Minister of Health wheth in view of the admission that the deaths of the twin childr of Councillor A. A. Furness, of South Wigston, near Leicest were due to post-vaccinal encephalitis, he proposed to tak any steps to prevent the further use of Government lymp in this district.—Mr. GREENWOOD replied: The answer i in the negative. I am advised that there is no reason to associate the deaths of these children with the use of Government lymph.

Deaths in Convict Prisons.

Mr. FREEMAN asked the Home Secretary how many cases of natural death, suicide, and attempted suicide, respectively, had taken place in the convict prisons, local prisons, and Borstal institutions, respectively, during the 12 months ended May 31st, 1931, giving age, sex, cause, and date in each case.—Mr. CLYNES replied: Of natural deaths there were 8 in convict prisons, 22 in local prisons, and 1 in a Borstal institution. Of suicides there were none in convict prisons, 3 in local prisons, and 2 in Borstal institutions. In compiling any return of attempted suicides there is always a difficulty in determining whether certain cases are real attempts at self-destruction or are merely feigned attempts, undertaken for some other purpose; but so far as can be ascertained, the number of cases which can properly be classed as attempts to commit suicide were in convict prisons 1, in local prisons 20, and in Borstal institutions 1.

MONDAY, JULY 13TH.

Pensions Ministry and Medical Treatment.

Major EVANS asked the Minister of Pensions whether he would produce and issue for general information a comprehensive and scientific record of the experiences and achievements of the Ministry in medical and surgical pheres, including treatment of wounds, disorders of the ervous system, and other diseases.—Mr. F. O. ROBERTS plied: A review of the Ministry's experience in the andling of the principal war disabilities has been prepared the Ministry for inclusion in the forthcoming "Official edical History of the War," which I understand will be sued at a very early date. I may add that I am entirely sympathy with my hon. and gallant friend's suggestion, d have already under consideration what further steps, any, can usefully be taken in this direction.

Army Recruits and Physical Unfitness.

Mr. LOUIS SMITH asked the Secretary of State for War hat was the percentage of those offering themselves for listment in the Army who were rejected in respect of ysical unfitness in each of the past ten years; and the tal number rejected in each of such years.—Mr. T. SHAW plied: The information is as follows:—

ecruiting ear ending n or about) ept 30th.	Number of men served with notice papers.	Total number rejected.	Number rejected for physical or medical reasons.	Percentage of men served with notice papers who were rejected for physical or medical reasons.
1921	106,071	58,343	51,021	48·1
1922	106,954	64,661	59,736	55·9
1923	86,039	53,491	49,550	57·6
1924	84,506	52,886	49,215	58·3
1925	89,277	56,228	52,207	58·5
1926	83,092	52,627	48,800	58·8
1927	83,814	54,195	50,396	60·1
1928	82,938	51,509	47,552	57·3
1929	72,268	43,023	39,359	54·4
1930	66,717	39,022	35,425	53·1
	861,676	526,285	483,291	56·1

Pensions and Final Medical Awards.

r. MARCUS asked the Minister of Pensions if he was re of the hardship caused by the granting of final rds in cases of recurrent disability, such as neurasthenia, poisoning, malaria, and others; and if he was prepared grant further consideration to ex-Service men whose ability might recur at any time after their final award finished, with a view to awarding them either treatment full allowances over a certain period or a further award nsion, conditional on the duration of a man's illness was directly due to one of the recurrent disabilities ned.—Mr. F. O. ROBERTS replied: A final award , under the statutory regulations, made until the man's ndition is reasonably stable, each case being considered its merits and in the light of expert opinion as to the rticular ailment or disease. In any event the man has right of appeal for a year to an independent appeal ibunal. If a condition due to war service subsequently lls for treatment, it can be provided and allowances can so be paid where they are justified notwithstanding that a nal award may have been made. If, as a result of such eatment, a final award should be found to have been riously erroneous as an assessment for permanent purposes, further grant of pension can be made under special anction.

Vacancies

For further information refer to the advertisement columns.

Aberdeen Royal Infirmary.—Jun. Asst. Surgeon.
Accrington, Victoria Hospital.—H.S. £150.
All Saints' Hospital for Genito-Urinary Diseases, Finchley-road, N.W.—H.S. At rate of £150.
Altrincham General Hospital.—Sen. and Jun. H.S. At rate of £150 and £100 respectively.
Beckenham, Kent, Bethlem Hospital, Monks Orchard, Eden Park. Res. H.P. At rate of £150.
Bedford County Hospital.—Asst. H.S. At rate of £130.
Birmingham P.H. Dept., Tuberculosis Section.—Asst. M.O. £400.
Blackburn County Borough.—Asst. M.O.H. and Asst. School M.O. £500.
Bradford Children's Hospital.—H.P. £120.
Bradford Royal Infirmary.—Three H.S.'s. Each £150.
Brighton, Royal Sussex County Hospital.—Cas. H.S. £120.
Brighton, Sussex Maternity and Women's Hosp.—Res. H.S. £130.
Bury Infirmary, Lancs.—Third H.S. At rate of £150.
Calcutta, Presidency General Hospital.—Second Res. M.O. Rs. 1000 a month.
Cambridge, Addenbrooke's Hospital.—Res. Anæsthetist and Emergency O. At rate of £130.
Chester, East Lancashire Tuberculosis Colony, Barrowmore Hall, Great Barrow.—Asst. M.O. At rate of £275.
City of London Hospital for Diseases of the Heart and Lungs, Victoria Park, E.—H.P. At rate of £100.
Connaught Hosp., Walthamstow, E.—Res. H.P. At rate of £100.
Coventry, Coventry and Warwickshire Hospital.—Res. Cas. O. £125.
Dreadnought Hospital, Greenwich.—Physician, for Dept. of Physical Medicine. 50 guineas.
Dudley, Guest Hospital.—H.S. and Asst. H.S. £200 and £170, respectively. Also Hon. Orthopædic Surgeon
Dumfries, Crichton Royal Mental Hosp.—Asst. Physician. £350.
Durham County Hospital.—Two H.S.'s. Each £150.
Durham University College of Medicine.—Jun. Demonstrator in Physiology. £250–£300.
East London Hospital for Children, &c., Shadwell, E.—H.S. and Cas. O. £125.
Essex County Council.—First Asst. M.O. £750–£800.
Exeter, Royal Devon and Exeter Hospital.—H.P. and H.S. to Special Depts. Each at rate of £150.
Gravesend and North Kent Hospital.—Jun. H.S. £100–£150.
Great Yarmouth General Hospital.—H.S. £140.
Harrogate Infirmary.—Sen. and Jun. H.S.'s. At rate of £150 and £125 respectively. Also H.P. At rate of £150.
Hertford County Hospital.—H.P. At rate of £150.
Hove, Lady Chichester Hospital.—Jun. H.P. At rate of £50.
Huddersfield Royal Infirmary.—H.S. At rate of £150.
Hull Royal Infirmary.—3rd H.S. At rate of £150.
Inverness, Royal Northern Infirmary.—Two H.S.'s. Each at rate of £100.
Ipswich, East Suffolk and Ipswich Hospital.—Cas. O. £120.
Kent Education Committee.—Temporary School Medical Inspector. 12 guineas per week.
Kidderminster and District General Hospital.—H.S. £150.
King Edward Memorial Hospital, Ealing, W.—Sen. and Jun. Res. M.O.'s. £250 and £150 respectively.
Kingston-upon-Hull, City and County of.—Sen. Asst. M.O.H. for Maternity and Child Welfare Dept. £800.
Lancaster Royal Infirmary.—Jun. H.S. £130.
Leamington Spa, Warneford, General Hospital.—Hon. Surgeon for Diseases of Ear, Nose, and Throat.
Leeds Hospital for Women.—H.S. At rate of £100.
Leicester Royal Infirmary.—Sen. M.O. for Venereal Diseases Dept. £500.
Liverpool Eye and Ear Infirmary, Myrtle-street.—H.S. to Ophth. Dept. £120.
Macclesfield, Cheshire County Mental Hospital, Parkside.—Asst. M.O. £350.
Manchester, Ancoats Hospital.—Res. M.O. and H.P. At rate of £150 and £100 respectively.
Manchester, Manchester and Salford Hospital for Skin Diseases.—H.S. At rate of £100.
Manchester Victoria Memorial Jewish Hospital, Cheetham.—Jun. H.S. At rate of £125.
Margate Royal Sea Bathing Hospital for Surgical Tuberculosis.—H.S. At rate of £200.
Newcastle-upon-Tyne, Newcastle General Hospital.—Two H.P.'s and three H.S.'s. All at rate of £150.
Newcastle-upon-Tyne, Royal Victoria Infirmary.—Whole-time Jun. Surg. Reg. £150. Also Sen. Surg. Reg. £100.
Northwood, Mount Vernon Hospital.—H.S. At rate of £150.
Nottingham General Hospital.—Cas. O. At rate of £200.
Port Said, British Hospital.—Res. Asst. M.O. £375.
Portsmouth, St. Mary's Hospital, St. Mary's Institution, &c.—Second Asst. Res. M.O. £300.
Reading, Royal Berkshire Hospital.—Res. Anæsthetist. At rate of £150.
Rotherham Hospital.—Cas. H.S. £150. Also H.P. £180.
Royal College of Physicians, Pall Mall East, S.W.—Streatfeild Research Scholarships. £250.
Royal Northern Hospital, Holloway, N.—Asst. Pathologist. £500.
Royal Waterloo Hospital for Children and Women, Waterloo-road, S.E.—Hon. Urological Surgeon.
St. John's Hospital, Lewisham, S.E.—H.S. and Cas. O. Each at rate of £100.
St. Leonards-on-Sea, Buchanan Hospital.—Jun. H.S. At rate of £125.
St. Thomas's Hospital Medical School, S.E.—Sen. Demonstrator in Anatomy. £500.
Salisbury General Infirmary.—H.P. £150.
Scunthorpe and District War Memorial Hospital.—Res. Surgeon. Also second H.S. £250 and £150 respectively.
Sheffield, Children's Hospital.—Whole-time Med. Registrar-Pathologist. £350. Also 3rd Res. M.O. At rate of £80.
Sheffield, Jessop Hospital for Women.—Asst. H.S. At rate of £100.
Sheffield Royal Hospital.—Cas. O. and Res. Anæsthetist. At rate of £150 and £80, respectively. Also Ophth. H.S. £120.
Sheffield Royal Infirmary.—H.S. and Second Asst. Cas. O. Also Ophth. H. S. Each at rate of £80.
Southampton, Free Eye Hospital.—H.S. £150.
Southport General Infirmary.—Jun. H.S. £150.
South Shields, Ingham Infirmary.—H.S. £150.
Stafford, County Bacteriological Laboratory.—Bacteriologist. 12 guineas per week.
Staffordshire, Longton Hospital.—H.S. £120.
Swansea General and Eye Hospital.—H.P. £150.
Swindon and North Wilts Victoria Hospital.—Res. M.O. At rate of £125.
Tynemouth.—Asst. M.O. for Poor Law Institution, Preston-road, North Shields. £300.
Walsall General Hospital.—H.P. At rate of £150.
Windsor, King Edward VII. Hospital.—Hon. Asst. P. to Out-patient Dept.

The Chief Inspector of Factories announces vacancies for Certifying Factory Surgeons at Teddington (Middlesex), and at Higham Ferrers (Northants).

Vacancies are announced for a Physician and a Surgeon as Medical Referees under the Workmen's Compensation Act, for Circuit 31, County Courts, Abercynon, &c.—Applications should reach the Private Secretary, Home Office, Whitehall, not later than August 5th.

NOTES, COMMENTS, AND ABSTRACTS

MENTAL INEFFICIENCY AND ADOLESCENT CRIME.*

BY W. NORWOOD EAST, M.D., M.R.C.P. LOND.,
ONE OF H.M. COMMISSIONERS OF PRISONS.

THE Mental Deficiency Act of 1927 has been in operation long enough to enable some of the diagnostic difficulties arising from the statutory definitions of mental defectiveness to be reviewed. A clear appreciation of those difficulties is of particular importance in criminal cases, and is essential for accurate testimony.

The distinction of idiocy and imbecility from insanity has been recognised by law and medicine for many years. The term "feeble-minded," however, denoting a less severe grade of mental deficiency than imbecility, was introduced into medical literature somewhat tardily. The word "feeble-mindedness" appears in the "Dictionary of Psychological Medicine," edited by Dr. D. Hack-Tuke, and published in 1892, and the reader is referred to dementia, idiocy, and imbecility for information. But there is no mention of feeble-mindedness in any of the descriptions of dementia, nor in the article by the late Dr. G. E. Shuttleworth on idiocy and imbecility; and we are left to conclude that the word "feeble-mindedness" connotes these conditions.

Dr. W. Ireland,[1] in 1900, wrote:—

> "Idiocy is mental deficiency or extreme stupidity, depending upon malnutrition or disease of the nervous centres, occurring either before birth or before the evolution of the mental faculties in childhood. The word 'imbecility' is generally used to denote a less decided degree of mental incapacity. The term 'feeble-mindedness' is now much used in the United States of America, both in legal and medical documents, to denote both idiots and imbeciles."

Still later, in 1906, Dr. Maudsley[2] wrote:—

> "Idiocy is a defect of mind which is either congenital, or due to causes operating during the first few years of life, before there has been a development of the mental faculties, and may exist in different degrees; the person afflicted with it may have the power of articulate speech and manifest a limited degree of intelligence, or he may be utterly destitute of any semblance of intelligence and of the power of speech, being little more than a mere vegetative organism. Imbecility is simply weakness of mind owing to defective development, and may be of every degree of deficiency, moral and intellectual; on the one hand, passing by imperceptible gradations into idiocy and, on the other hand, passing insensibly into ordinary intelligence."

Before this, however, high-grade cases were recognised as a distinct group by some of those who were concerned with their supervision. Amongst these were the medical officers of English prisons, who for many years drew attention in their official reports to a class of prisoner they described as weak-minded, and it is clear that they had in mind people who were neither idiots, imbeciles, nor insane. Again, in 1889 the Report of the Royal Commission on the Blind, Deaf, and Dumb recognised a class of feeble-minded children other than imbeciles, and made a recommendation that they should be separated from ordinary scholars in public elementary schools. And when a Departmental Committee on Defective and Epileptic Children was appointed in 1896, the terms of reference expressly differentiated feeble-minded and defective children from idiots and imbeciles; and the Committee reported that the feeble-minded children referred to in their inquiry were a distinct class from imbeciles, and differed both from ordinary children and from imbeciles.

By 1904 the term "feeble-minded" was in general use, and the class of case to which it referred was recognised to be less defective than idiots or imbeciles. A Royal Commission was appointed that year "to consider the existing methods of dealing with idiots and epileptics, and with imbecile, feeble-minded, or defective persons not certified under the Lunacy Laws," and the Royal Commissioners recommended the use of the words "mentally defective" "as a general term indicative of all classes of mental disorders, thus displacing the word 'lunacy' from that position." They defined "idiots" as persons so deeply defective in mind from birth or an early age that they are unable to guard themselves from common physical dangers, such as, in the case of young children, would prevent their parents from leaving them alone. "Imbeciles" were persons who are capable of guarding themselves against common physical dangers, but who are incapable of earning their own living by reason of mental defect existing from birth or an early age. "Feeble-minded persons" were persons who may be capable of earning a living under favourable circumstances but are incapable from mental defect existing fr birth or an early age (*a*) of competing on equal term with their normal fellows; or (*b*) of managing them-selves and their affairs with ordinary pruden "Moral imbeciles" were persons who from an ea age display some mental defect, coupled with str vicious or criminal propensities, on which punishm has little or no deterrent effect. These definitio were modified in the Mental Deficiency Act, 19 as follows:—

> "Idiots—that is to say, persons so deeply defective mind from birth or from an early age as to be unable guard themselves against common physical dangers.
>
> "Imbeciles—that is to say, persons in whose case th exists from birth or from an early age mental defectiven not amounting to idiocy, yet so pronounced that they incapable of managing themselves or their affairs; or, the case of children, of being taught to do so.
>
> "Feeble-minded persons—that is to say, persons in wh case there exists from birth or from an early age men defectiveness not amounting to imbecility, yet so pronou that they require care, supervision, and control for th own protection or for the protection of others, or, in the of children, that they by reason of such defectiveness a to be permanently incapable of receiving proper ben from the instruction in ordinary schools.
>
> "Moral imbeciles—that is to say, persons who from early age display some permanent mental defect coupl with strong vicious or criminal propensities in which punishment has had little or no deterrent effect."

New Definitions Under the Act of 1927.

Experience in the administration of the Mental Deficiency Act suggested the desirability of certain amendments, and when encephalitis lethargica spread throughout Europe in 1918, and was in many cases followed by the post-encephalitic syndrome public opinion became aroused by the inadequate provisions which were available for protecting these patients and the public from the consequences of the moral changes which were induced by the disease. The Mental Deficiency Act of 1927 followed. Defectives are defined in Section 1 of this Act thus:—

> "Idiots—that is to say, persons in whose case there exists mental defectiveness of such a degree that they are unable to guard themselves against common physical dangers.
>
> "Imbeciles—that is to say, persons in whose case there exists mental defectiveness which, though not amounting to idiocy, is yet so pronounced that they are incapable of managing themselves or their affairs or, in the case of children, of being taught to do so.
>
> "Feeble-minded persons—that is to say, persons in whose case there exists mental defectiveness which, though not amounting to imbecility, is yet so pronounced that they require care, supervision, and control for their own protection or for the protection of others, or, in the case of children, that they appear to be permanently incapable by reason of such defectiveness of receiving proper benefit from the instruction in ordinary schools.
>
> "Moral defectives—that is to say, persons in whose case there exists mental defectiveness coupled with strongly

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* Read at a Conference of Prison Medical Officers at the Home Office, March 28th, 1931.

vicious or criminal propensities and who require care, supervision, and control for the protection of others."

The Act further declares that "for the purposes f this section, mental defectiveness means a condition f arrested or incomplete development of mind xisting before the age of 18 years, whether arising rom inherent causes or induced by disease or injury." hese familiar definitions are given at length to llustrate the change that has taken place during ecent years in the conception of mental deficiency. We now deal with cases under this heading whom . D. Turner[4] graphically asserts belong to the otch-potch of conditions known as mental deficiency. We are not concerned with mental deficiency in hildren, nor with idiots who never appear in a criminal ourt; and since the diagnosis of imbecility presents o practical difficulties, it is only necessary to direct ur attention to-day to feeble-minded persons and moral defectives. Before doing so certain alterations n the Act of 1927 require consideration.

Mental defectiveness as now defined seems to refer o other cases than such as were deemed to be mentally efective by the Royal Commissioners appointed in 904. Nevertheless the conduct of a patient may be garded by one medical man as evidence of feeble-indedness, and by another practitioner of equal thority as the result of a psychosis—e.g., the ost-encephalitic delinquent, whose conduct is constantly dealt with by certification under the Mental eficiency Act, although in many cases the indications mental abnormality are those of mental disease d not defect. Marshall has pointed out that the st-encephalitic, naughty, restless child who, like ter Pan, never grows up, is suffering from psycho-otor excitement similar to that which may occur the course of an attack of mania of the manic-pressive type.[5] Further, it may be argued that e biogenic psychoses of adolescence fall within the finition of mental defectiveness. However this ay be, the Amending Act removes certain barriers hich formerly separated mental deficiency and sanity, and demands a wider conception of the nditions for which certification is desirable. And hereas certain medical men appeared to view mental ficiency in the light of the Act of 1913 in terms of tive brain structure, this, although true for ry amentia, is probably not so applicable to econdary amentia, where the emphatic criterion of ental defectiveness, as defined in the Act of 1927, defective mental functioning expressed by abnormal onduct and social incapacity.

A second important change in the later Act is the rovision that the defectiveness may be brought bout by disease or injury arising before the subject is 18 years of age. And it has been observed many times that patients who become affected after this age may be ineligible for the benefits of institutional care in consequence. In other patients the date of onset of ambulatory disease may be undetermined, and the diagnosis of mental defectiveness is abrogated in consequence.

A third noteworthy alteration is the omission of the word "permanent" from the definition of moral defectives in the Act of 1927. The omission avoids the rejection of post-encephalitic cases, for, in the present state of medical knowledge, it is doubtful to what extent the moral defects attributable to this disease are permanent. But the amendment sometimes embarrasses the medical examiner, and deprives him of a useful aid to diagnosis.

In dealing with criminal cases the practitioner must always be prepared to support his opinion under cross-examination in a court of law. Facts observed by himself can be substantiated with assurance. But the arrested or incomplete development of mind which is so pronounced that the subject "requires care, supervision, and control for his own protection and that of others," may be determined only by the history. Generally speaking, the medical man has no first-hand knowledge of this, and it is essential to test it as far as possible; otherwise harmless incidents may assume undue importance, and fictitious exaggerations or intentional inaccuracies, if accepted without caution and criticism, may lead away from truth.

The mental defect of the feeble-minded may be mainly one of intelligence; that of the moral defective may be expressed by defects of character and temperament, and overlapping may occur in either direction. Further, the physical, physiological, and sociological features of each case must be considered as well as the innate dispositions and emotional qualities. Moreover, the greater the intelligence defect the less are defects of character and temperament required for the diagnosis of feeble-mindedness, and the moral defective may show little or no defect of intelligence. Further, as the mental defect of the feeble-minded is a general and not a special defect, so the mental defect of the moral defective is a general defect of character and temperament, of the instinctive tendencies and their emotional qualities, and not a defect in any special or limited direction. But defects of character and temperament, expressed by peculiarities of conduct, are common to mental defectiveness, and to certain normal and abnormal mental states with which they may be confused.

The Differentiation of Clinical Groups.

At the outset we require a working conception of the normal mental state. This may be regarded conveniently as the usual mental reaction-type of individuals belonging to the same class and race and of the same education; normal conduct may be regarded as a composite abstraction, the result of their average variations. If we wish to go further and distinguish between the abnormal and the pathological, we may find assistance from C. Spearman,[6] who points out that "for most practical purposes the crux does not lie in settling whether a person is pathological or not; but whether he is too much so to be tolerated." Accepting this, we are faced with the fact that the behaviour of criminals, as well as of persons who are mentally pathological, has been found intolerable by others; and Spearman refers to the views of those who consider that criminals should be looked on only as mentally ill and punishment be abolished. A reply to this from those who have spent their professional lives in prison work might appear biased, so I again turn to Prof. Spearman, who writes:—

> "One answer to such a claim would be to make a general comparison between the denizens of the jail and those of mental hospitals. For although no single formal definition may serve as a reason to distinguish them adequately, and although certain individual cases might equally well be assigned to either residence, yet on the whole the two classes stand out distinctly enough. If any man really could not tell which class he had got among, we might safely prophesy to which of them he was heading."

Clinical psychiatry assists us in the differential diagnosis between cases of high-grade mental defectiveness and the symptom-complex of any particular mental disorder. Psychology guides us in our pursuit of character formation, and helps us to appreciate the temperamental faults which suggest mental defectiveness. But the present fluid state of psychology, the various schools of psychological thought, and the disputes among eminent psychologists concerning basic principles, may leave the inquirer dissatisfied with any single line of approach. The hormic, hedonistic, behaviouristic or other school of psychology may provide the most acceptable solution to any particular problem of criminal conduct, and the investigator may prefer to retain his psychological freedom in eclecticism. But many students of character, following the teachings of W. McDougall, A. F. Shand, C. Burt, A. G. Tansley, and others, perceive the essential factors of human conduct to be the innate instinctive dispositions, and their accompanying emotional qualities.

In criminal conduct the acquisitive, aggressive, sex, social, and self-preservative instincts are most frequently at fault, and with the associated emotions act with various degrees of strength in different individuals, and in the same individual at different times. Two or more instincts may be simultaneously in action, opposing or reinforcing one another, and certain life-histories seem to indicate an entire lack of one or other instinct. It is a matter of common observation also that, when the unusual strength of some particular instinct tends towards anti-social conduct, the individual learns to restrain its activities in order that he may adjust his life successfully. Although certain psychologists seem to have no place for the will in their explanation of human conduct, many practical observers find it necessary to postulate an agency, in addition to reason, by which the instinctive tendencies and the emotions become inhibited, and character and conduct modified.

The failure of delinquent adolescents to exercise the self-control demanded by social convention may indicate the incomplete or arrested development of mind which we call mental defectiveness. But it may be due to malnutrition of character, or failure to grasp the value of inhibition and develop a process capable of growth. Observation under experienced supervision, discipline, and training is sometimes necessary to determine whether the fault is due to mental defectiveness or whether the essential ingredients of character can expand and the subject become socially acceptable. As the growth of intelligence is slow in certain individuals, so, too, is character development delayed in others. A common manifestation of this fact is mental instability, which may remain a handicap throughout life, although the subject may become stabilised with the passing of adolescence if growth is resumed on lines which are favourable to social adjustments.

Certain observers hold that mental instability results from defect of mental function, others from excess. Dr. A. F. Tredgold,[7] bearing in mind the instability which is common in the early stages of dementia paralytica and arterio-sclerotic dementia, and that the neurones in these conditions have been shown to be deteriorated, feels justified in considering constitutional mental instability as due to an inherent defect of the controlling functions. On the other hand, emotional instability is a prominent symptom of exophthalmic goitre, in which the general symptoms are attributed by many observers to excitation of the sympathetic, and no material changes are to be found in the cervical sympathetic, brain, or spinal cord.

It might be thought that the mental instability of adolescence would be amenable to organotherapy, in view of the important part played by the endocrine glands at this period of life, and the knowledge that a definite relation exists between their secretions and certain psychoses. The results of my own experience in treating selected cases of mental instability in juvenile delinquents on these lines have been discouraging. The complex reactions which cause the endocrine imbalance make the selection of a suitable therapeutic preparation experimental, even if the appropriate ingredients are capable of isolation in an active state and can be suitably combined. But the researches of biochemists lead one to hope that the treatment of certain cases of adolescent delinquency by glandular extracts may become established in the future.

The clinical manifestations of mental instability are excessive ideational, instinctive and emotional reactions, which, in severe cases, are so frequent and so little inhibited that social adaptation fails. If defects of intelligence are present also, the diagnosis of mental defectiveness is clear. If they are absent, the question arises whether the condition satisfies the rubric "mental defectiveness," whether the disproportionate reactions are due to an undeclared psychosis, or whether the symptoms indicate a transitory phase of adolescent growth.

The Constitutionally Inefficient.

If the controlling functions of the mind are known to have been impaired throughout the pre-adolescent period, and the environmental conditions have been entirely favourable, we can exclude with some degree of accuracy both pre-psychotic and transient adolescent instability, and have some reason to suppose that we are dealing with an inherent constitutional defect which may satisfy the statutory definition of mental defectiveness. But it seems proper to hesitate before a transitory delay in the development of character and control is stigmatised as mental defectiveness, unless enforced by the exigencies of any particular case. For all will agree that the Mental Deficiency Act of 1927 should implement the spirit of the Mental Treatment Act of 1930. Many cases of this nature can be determined only by the efflux of time, and the after-careers of some who improve temporarily show permanent defects when they are released from supervision. On the contrary, other cases who for years appear to be examples of permanent mental defectiveness recover later, and are then established as cases of delayed development.

The child of a bad-tempered woman was too nervous to read aloud at school, and when her teacher complained to her mother she was beaten, with the result that she became rebellious, wilful, and obstinate. She went into domestic service when 13 years of age, and stole a ring from her mistress; several thefts followed. She was eventually sent to an industrial school, and later to a reformatory. At this period she was reported to be a thief and a liar, and to exercise a bad influence on other girls. On her return home she worked for a time in a factory, but when 18 years of age was put on probation for sleeping out. She was sent to a home but ran away and returned to her parents but later took a young girl away with her to a distant city, where she was soon after arrested for being drunk and disorderly. She was then sent to a Borstal Institution where her conduct was so outrageous and her history so anti-social that she was considered to be mentally defective and was certified and sent to an institution for defectives. She became still more difficult, and was transferred to a mental hospital, whence she escaped twice. She was then sent to another mental hospital and escaped from there also, and did not come under supervision again until she committed another theft. Her records show that she was liable at this period to outbreaks of rage and violence for no apparent cause. She damaged the hospital property, assaulted the nurses, threatened the doctor, and attempted suicide. She was deceitful, and appeared to lack any [illegible] of right or wrong or of her social obligations, and [illegible] considered to be incapable of earning her own living. [illegible] soon after, during a period of detention in prison, [illegible] behaved well in spite of this.

Some time after her release, and when 25 years of age, she married a widower several years her senior. She was devoted to him and his child, and lived a happy, useful, and domesticated life for six years. Her husband was then taken to hospital for an operation, and she stole from a city store during this period of stress and when tempted by a former associate. She was sentenced to a short term of imprisonment, during which she conducted herself rationally, and was industrious, capable, alert, and intelligent. Her mental age was 13–14 years, her vocabulary 12,520 words. She was well informed on matters of ordinary interest and common knowledge, and discussed with me her past conduct with frankness and insight. She showed no evidence of emotional disturbance, and had a clear appreciation of her moral obligations. Her perception, judgment, and reasoning were good. I found no evidence of mental defectiveness or mental disease. She was, in fact, stabilised. The mental conflicts of childhood were apparently responsible for the anti-social conduct of subsequent years, but were now replaced by harmony and maturity and consequent social adjustment. Perhaps a different view might have been taken in the past if her medical examiners had been able to obtain her coöperation and appraise the emotional stresses which contributed to the anti-social conduct of her early life.

I say "contributed" advisedly. For, as Devine[8] points out, "the behaviour of an individual is determined by the prolongation into the present of his past experiences; by his inherited peculiarities; by his physiological state; by the rhythm of his vital processes and the various transformations of the reproductive functions; and by the manifold life situations with which he is confronted." The history and later examination of this woman indicated a variation from the normal, over and above her early temperamental faults. For she stole on the last occasion when temptation was not excessive and the environmental disharmony was insufficient ordinarily to cause delinquency. This difference is perhaps best described as a constitutional psychic inferiority, limiting the term to those who, through some defect in their mental make-up—usually of volition—are most aptly placed between the temperamental defectives and normal individuals.

Offenders of this clinical type belong to no special age-group and their offences are chiefly of a minor character. They are entirely different from the active, determined criminal whose forcefulness, initiative, and resource outrage society. Many habitual offenders fall into this group, although they may not be recognised during adolescence until efforts at rehabilitation by relations, friends, and after-care associations prove ineffectual. They usually adapt themselves successfully in a penal institution, and are often shrewd, able, and willing workers under supervision, and may intend to reform. But they follow the line of least resistance in the outer world and drift without anchorage. And although they may appreciate their social obligations and possess foresight and discrimination, they are incompetent to deal with situations which demand the suppression of temporary desires—not, seemingly, because the instincts and emotions act with overpowering force, but from passive inadequacy to negotiate life according to social conventions and the law's demands. The will is impotent. The striving for superiority Adler [9] asserts "is an intrinsic necessity of life itself. It lies at the root of all solutions of life's problems, and is manifested in the way in which we meet these problems." It however leaves them unconcerned.

These subjects belong to the subnormal group of inefficients, and the medical witness cannot testify under cross-examination that they are mentally defective. Their failure in life is apparently the result of a limited and not a generalised defect, and the observer cannot demonstrate evidence of mental defectiveness as a result of his own examination. Also, he must remember that "the diagnosis of mental deficiency may be established without a full history from the data observed by the medical examiner, but it can never be firmly sustained, however much it may be suspected, on the evidence of history alone." [10] Moreover, it would seem that the medical witness is unable to testify that the condition is essentially due to an arrest or incomplete development of mind, however strongly he believes it to be due to the failure of a particular mental function. And, still further, he cannot exclude from many cases the influence of a disadvantageous environment or unfavourable upbringing, although he may exclude effects arising from disease or injury before the age of 18.

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2. Maudsley, H.: Responsibility in Mental Disease, London, 1906, p. 66.
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4. Central Association for Mental Welfare Conference on Mental Deficiency, 1930, p. 156.
5. Marshall, R. M.: Jour. Ment. Sci., 1927, lxxiii., 593.
6. Spearman, C.: Psychologies of 1930, Normality, London, 1930, p. 450.
7. Tredgold, A. F.: Relation of Mental Deficiency to Mental Disease, Mott Memorial Book, London, 1929, p. 117.
8. Devine, H.: Recent Advances in Psychiatry, London, 1929, p. 17.
9. Adler, A.: Psychologies of 1930: Individual Psychology, London, p. 398.
10. Report of Mental Deficiency Committee, 1929, Part III., p. 10.

(To be continued.)

A HOSPITAL FOR FUNCTIONAL NERVOUS DISORDER.

THE ancient foundation of St. Luke's Hospital now concentrates its activities mainly on the Woodside Nerve Hospital, which was opened in November last for the reception of cases of functional nervous disorder.[1] The Earl of Athlone, the new president, visited the Woodside Nerve Hospital on June 30th, and was received by the treasurer, Lord Blanesburgh, the committee of governors and such of the honorary consulting staff as were able to be present. Celebrations at the University of Leeds, however, prevented the presence of several of the latter, including Sir John Bland-Sutton, Sir Farquhar Buzzard, Sir John Rose Bradford, Lord Dawson, and Sir Humphry Rolleston.

The hospital stands in some 6¾ acres of ground, overlooking Highgate Woods, and has accommodation for 50 patients, 20 men and 30 women. Most of the rooms in the ward blocks are single bedrooms, and all of them face south, each one opening on to a broad verandah. There are also some private sitting rooms. The treatment block contains rooms for hydrotherapy, colon lavage, massage, light and electrical treatment. There are also in this block dental and X ray rooms, a photographic dark room, a dispensary, and large laboratories equipped for investigation and research. All the capital expenditure in building and equipping has been borne by the St. Luke's Hospital Foundation; but its resources are unequal to the heavy cost of maintaining the new hospital. This must therefore be borne to a great extent by the payment of patients according to their means. At the present time a minimum charge of 5½ guineas a week is made on each bed, two guineas extra being charged for a single room. At the same time every effort is made by means of rebates on these charges, allowed at the discretion of the Committee, to make the resources of the hospital available for those of limited means. The charges are inclusive of all necessary forms of treatment, the only extras charged being for personal laundry, special nurses, and such personal comforts as are not generally included in treatment.

During the six months that the Hospital has been open 65 patients have been admitted, and it is stated that the majority of those discharged have gone out recovered.

THE CORNER OF GOWER PLACE.

THE new building of Messrs. H. K. Lewis, at the corner of Gower-street and Gower-place, is now complete, and was shown to distinguished visitors at a reception held on July 9th. Sir Gregory Foster, formerly Provost of University College and Vice-Chancellor of the University of London, recalled his student days, when Lewis's consisted of a single house with a total frontage of 25 feet and one shop, about 15 feet by 16 feet, which used to be uncomfortably crowded with students at the beginning of every term. The architectural future of the corner of Gower-street and Gower-place, the site occupied by the new building, had always been an anxiety to the college authorities; now all anxiety had been set at rest by the way in which the rebuilding had been carried out. University College, he said, was fortunate in having at its doors an institution which provided real help in its educational work, and he congratulated "Lewis's" on the high traditions of sound service maintained by their firm.

Prof. H. R. Kenwood gave an address on Text-books and Education, and Mr. H. L. Jackson, the chairman of Messrs. H. K. Lewis, Ltd., commented on the functions of manufacturers and distributors of books. So long as they sought to make the pathway between the producers and the consumers of books as smooth and as easy and as inexpensive as possible they performed a useful service. A word of praise from Mr. Percy Flemming, F.R.C.S., for the facilities offered by Lewis's circulating library concluded the addresses, and the guests were given an opportunity to inspect the attractive new premises.

PITUITARY CYST.

IN the paper with this title, by Dr. Ranyard West, on p. 69 of our last issue, the first reference should read:—

Worster-Drought, C., Dickson, W. E. Carnegie, and Archer, B. W. C.: Brain, 1927, l., 704.

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[1] See THE LANCET, 1930, ii., 986.

THE POINTS OF CONTACT IN ELECTRIC SHOCK.

In a paper published in 1927,[1] R. W. I. Urquhart adduced evidence that when an electric current passed through the brain a block was produced in the respiratory centre; if the heart were not severely damaged, artificial respiration should save the patient by giving the respiratory centre time to recover. Survival has been recorded even after eight hours' artificial respiration.[2] In a later communication[3] Urquhart, with E. C. Noble, showed that a similar block might be produced in the lower part of the spinal cord of a decerebrate cat, and even in peripheral nerves, by an alternating current. Last year O. R. Langworthy and W. B. Kouwenhoven demonstrated[4] that severe electrical currents, when passed through the brain, might cause permanent injury to the cells of the respiratory centres. They now describe experiments[5] on the respiratory damage caused by currents which do not flow directly through the brain.

They used rats, in which the heart is especially resistant to damage by electricity. The results indicate that a current passing through the cervical part of the spinal cord, or through the chest, may cause a suspension of respiration through a temporary block in the vagus nerves; a current passing through the hinder part of the body is much less likely to produce this effect. The authors propose to undertake a histological examination of the central nervous system of all the rats in this series in order to see whether cell change has taken place where the current has not passed through the brain. Of course with the shocks used—1000 volts for two seconds—much damage may be caused by heat alone. The continuous current caused more severe burning, and seemed to cause more cell damage. When passed between the two forelegs both kinds of current killed all the rats and caused much burning and destruction; when the current was passed from a foreleg to a hind leg 41 per cent. survived the alternating current, but all needed artificial respiration; when from a foreleg to the tail only 67 per cent. needed artificial respiration with the alternating and 54 per cent. with the continuous current, and when between the two hind legs none of the rats shocked with alternating current stopped breathing, though 29 per cent. of those shocked with the continuous current required artificial respiration.

It must be remembered, as Langworthy and Kouwenhoven point out, that respiratory block is not the only cause of death—perhaps not even the chief cause—from electric shock in man. In many cases, particularly of shock from low voltages, the cause is believed to be ventricular fibrillation. They quote the experiments of D. R. Hooker,[6] who succeeded in arresting ventricular fibrillation with injections of potassium chloride solution.

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[1] Jour. Indust. Hyg., 1927, ix., 140.
[2] Ibid., 1930, xii., 291.
[3] Ibid., 1929, xi., 154.
[4] Ibid., 1930, xii., 31; see THE LANCET, 1930, i., 1218.
[5] Jour. Indust. Hyg., 1931, xiii., 145.
[6] Amer. Jour. Physiol., 1929-30, xci., 305.

TRELOAR CRIPPLES' HOSPITAL, ALTON.—The National Sunday League has presented to this hospital a ward in the new Connaught block in memory of the late Mr. Henry Mills. A ward has also been presented by the Chine Helpers of Southampton.

A NEW CLINIC FOR RHEUMATISM.—The London General Omnibus Company's Employees' Friendly Society has set up a clinic for the treatment of rheumatism, together with dental surgeries, at 61, South Side, Clapham Common, S.W. The house has been adopted and equipped at a cost of over £7000, and the clinic, which was opened by the Minister of Health on July 3rd, is being administered in close association with Manor House Hospital, Golders Green, under the direction of Sir Ambrose Woodall, the senior surgeon.

Medical Diary

Information to be included in this column should reach us in proper form on Tuesday, and cannot appear if it reaches us later than the first post on Wednesday morning.

LECTURES, ADDRESSES, DEMONSTRATIONS, &c.

FELLOWSHIP OF MEDICINE AND POST-GRADUATE MEDICAL ASSOCIATION, 1, Wimpole-street, W.

MONDAY, July 20th, to SATURDAY, July 25th.—MILLER GENERAL HOSPITAL, Greenwich-road, S.E. Intensive Course in general medicine and surgery. Two weeks, daily 10.30 A.M., to 5.30 P.M., demonstrations, lectures, operations. For either week.—Further particulars from the Fellowship of Medicine.

WEST LONDON HOSPITAL POST-GRADUATE COLLEGE, Hammersmith, W.

MONDAY, July 20th.—10 A.M., Gynæcological Ward Visit. Genito-Urinary Operations, Skin Department. 11 A.M., Surgical Ward Visit. 2 P.M., Surgical Ward Visit. Medical, Surgical, Eye, Gynæcological Out-patients.

TUESDAY.—9.30 A.M., Operations. 10 A.M., Medical Ward Visit, Dental Department. 11 A.M., Throat Operations. 11.30 A.M., Surgical Clinical Demonstrations. 2 P.M., Medical, Surgical, Throat, Out-patients, Operations, Medical Ward Visit.

WEDNESDAY.—10 A.M., Medical Ward Visit, Children's Medical Out-patients. 2 P.M., Medical, Surgical, and Eye Out-patients. Gynæcological Operations. 4.45 P.M., Venereal Diseases.

THURSDAY.—10 A.M., Neurological Department. 11.30 A.M., Treatment of Fractures. 2 P.M., Medical, Surgical and Eye Out-patients. Genito-Urinary Department Operations.

FRIDAY.—10 A.M., Medical Ward Visit, Skin and Dental Departments. 12 noon, Medical Lecture. 2 P.M., Medical, Surgical, and Throat Out-patients. Operations.

SATURDAY.—9 A.M., Throat Operations. 10 A.M., Medical Ward Visit, Surgical and Children's Medical Out-patients.

CHARING CROSS HOSPITAL MEDICAL SCHOOL POST-GRADUATE COURSE.

SUNDAY, July 19th.—10.45 A.M., Mr. H. E. Batten: Various Forms of Club Foot. 11.45 A.M., Mr. J. Brigh Bannister: Some Common Disorders of the Menopause.

ST. MARK'S HOSPITAL, City-road, E.C.

THURSDAY, July 23rd.—4.30 P.M., Mr. E. T. C. Milligan: The Injection Treatment of Piles.

UNIVERSITY OF BIRMINGHAM.

TUESDAY, July 21st.—3.30 P.M. (at the General Hospital) Dr. H. Featherstone: Basal Anæsthesia.

FRIDAY (at the Children's Hospital).—3.30 P.M., Dr. B Tate: Eczema in Infants and Children.

Appointments

BAIRD, D. I., M.B., Ch.B. Edin., D.P.H., has been appointed Asst. Medical Officer of Health, Blackburn.

BLISS, T. P., M.B., Ch.B. Edin., Certifying Surgeon under the Factory and Workshop Acts for Mauchline, Ayr.

LEARMONTH, A. G., M.B., Ch.B. Edin., Asst. Medical Officer, Stirling.

Births, Marriages, and Deaths

BIRTHS.

ATKIN.—On July 7th, the wife of Dr. C. S. Atkin, The Glen, Sheffield, of a daughter.

GIBBERD.—On July 7th, at Welbeck-street, W., the wife of G. F. Gibberd, M.S., F.R.C.S., of a son.

SMITH.—On July 6th, at Cullingworth, Broadstairs, the wife of R. Wylie Smith, M.B., B.Chir., of a daughter.

WORSELDINE.—On July 10th, at Stonefield, Blackheath, the wife of Stanley C. H. Worseldine, Captain I.M.S., of a son.

MARRIAGES.

FAULKNER—WARDE.—On July 9th, at Plymouth, Odin T. Faulkner, C.M.G., Director of Agriculture, Nigeria, to Mildred Warde, M.S., F.R.C.S.

WALKER—DIPLOCK.—On July 11th, at the Parish Church, Croydon, Geoffrey Secker Walker, M.A., M.B., B.Ch. Oxf., Reading-road, Farnborough, Hants, to Joan, only daughter of Mrs. Diplock, of Barclay-road, Croydon, and of the late Mr. Hubert Diplock.

DEATHS.

ANDERSON.—On July 2nd, at a Manchester nursing home, George Reinhardt Anderson, M.B.E., J.P., F.R.C.S., of 45, Westbourne-road, Birkdale, Southport, aged 67.

CROSS.—On July 12th, at Worcester House, Clifton, Bristol, Francis Richardson Cross, F.R.C.S., J.P., LL.D., following an attack of influenza, aged 83.

N.B.—A fee of 7s. 6d. is charged for the insertion of Notices of Births, Marriages and Deaths.

ADDRESSES AND ORIGINAL ARTICLES

PUBLIC HEALTH—TO-DAY AND TO-MORROW.*

By W. G. Willoughby, M.D. Lond., D.P.H. Camb.,

MEDICAL OFFICER OF HEALTH FOR EASTBOURNE; PRESIDENT OF THE BRITISH MEDICAL ASSOCIATION.

This is the first occasion on which a full-time medical officer of health has held the position of president of the British Medical Association, but preventive medicine has formed from time immemorial an important part of the work of every branch of the profession. The existence of the medical officer of health and of the public health service is due to a very great extent to the fact that at all times members of the profession have observed and recorded the direct and contributory causes of disease, and have studied how disease generally, and diseases in particular, can be prevented. The Ministry of Health and medical officers of health are systematically applying and extending the results of these observations and records.

As regards the past, I will only briefly remind you of such evidence of progress as the increase in the expectation of duration of life, the decrease in the general death-rate, and in the infant mortality-rate, the disappearance or lessened occurrence of some diseases, the mitigation of the severity of many others, the wholesale advance in the skill, technique, and safety of surgery, and the improved provision for the care and prevention of sickness. The most casual observation shows the great improvement that has occurred. In spite of abundant evidence of progress, however, it is not possible to be satisfied with the position of the general health to-day.

Public Health To-day.

The medical officer of health regularly receives from the registrar of births and deaths copies of all certificates of deaths, and also receives notifications of certain illnesses—so far a definite and generally accurate summary of those events in his district. He knows the extent to which ailments are affecting elementary and some other school-children, and persons who attend certain clinics. He also has less definite, but abundant, information as to other illnesses that are occurring in his district. It is his duty to act in connexion with this constantly recurring mass of information, and his consequent sense of responsibility has sometimes rendered the medical officer of health in his plans for improvement vulnerable in the eyes of general practitioners to the charge of removing his neighbour's landmark. Such concentrated and depressing information is not so constantly before those members of the profession who are dealing for the most part with individual patients.

The medical officer of health has also to study the mass of statistical information supplied to him weekly, quarterly, and annually by the Registrar-General, and this also makes a conscientious officer more restive. Without going into many figures from these and other statistics, there are some facts to which I wish to draw attention that indicate very clearly how much room there is for improvement in the public health.

The annual statistical summary of the Registrar-General for England and Wales demonstrates that there are far too many deaths at early ages. The *expectation of life*, according to the Registrar-General's last life-table, is still only 55 years for males and 59 years for females, and though the vitality of the nation has been steadily improving generally, the life-tables show almost no change at the ages of adolescence; from 30 years onwards there is but a slight increase in vitality, while at 50 the increase in expectation of life is only about two years. At advanced ages the progress is even less. In fact, the greatest part of the increase is due to the reduction of infantile mortality after the first week of life.

We are still on an average far short of the 70 years of the Psalmist. We are also faced with the position that his pessimistic description of the age-group 70 to 80 of his time applies far too truthfully to many of the years short of 70 in a great proportion of our population of the present day.

Illness and Physical Defect in Early Childhood.—An increase in the expectation of life is worse than useless unless the life so prolonged is healthy enough to be enjoyed; sickness makes it too often a doubtful blessing. The large amount of illness which must have occurred coincidently with 40,000 deaths in one year of young children who escaped the risks of infancy, while serious in itself, must also have been a leading cause of the indifferent health and permanent physical defects of so many of the survivors in their later years. Damage-rate is more important to the survivors than death-rate. Of elementary school-children an average of 8 to 10 per cent. are unfit to attend school owing to illness, and 1 in 5 of those attending has some physical defect. It is noteworthy that the children arriving at school at the age of five are already affected; the percentage of ailments is substantially diminished before they leave. Much of the neglect of defect at the pre-school age cannot be overcome, and will still have its injurious effect when the children become adults. A few years ago I made an investigation into the history of 504 mentally retarded children of this district who were not mentally deficient. The apparent causes were multiple in most instances, but early ill-health was the definite cause of the retardation in 47 per cent. of the cases, and a contributory cause in most of the others.

Health of Young Adult Population.—As examples of the unsatisfactory position to-day of the general health, early deaths and sickness in early life stand out prominently; other examples are the vast amount of sickness shown by national health insurance reports, and the wholesale rejection of young adults who have tried to enter the Navy, Army, and Air Force Services. During the war only 36 per cent. of would-be recruits between the ages of 18 and 42 qualified for active service. This unsatisfactory position still obtains. To a question in the House of Commons last year the Secretary of State for War replied that in 1929 5 per cent. were rejected for diseases of the middle ear, and over 4 per cent. for diseases of the heart. Defects of the lower extremities, dental defect, defects of vision, and insufficient weight caused rejections in each case of 2 to 3 per cent. The defects too frequently pointed to some illness or neglect in early childhood. The only marked improvements compared with the figures of 1910 were in dental condition and chest measurements.

As regards the sickness statistics connected with National Health Insurance, in any year an average of about half the insured population comes under treatment by insurance medical practitioners. The claims for sickness and disablement benefit have increased continuously, and have practically doubled in recent years.

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* Abridged from the presidential address delivered before the British Medical Association at Eastbourne on July 21st.

These are only some few examples of the state of the public health. Other examples include the multiplicity of hospitals, and the enormous sale of patent medicines.

The Future.

In considering the outlook for the future the nature and constitution of the public whose health is to be improved is of primary importance. Owing to the reduction in the birth- and death-rates we now have to deal with an increasingly older population than in the past. This is due mainly to the decrease in the number of young people, for the life of the older generations is being prolonged but slightly. The average age in England and Wales at the 1921 census was 30·6 (males 29·9 and females 31·2). Ten years previously it was two years less, and in 1891 four years less. Corresponding figures for the 1931 census are not yet available in detail, but it is obvious that the change is now even more marked.

As the population becomes older the prospect of a further reduction in the death-rate becomes less and less.

REDUCTION OF THE BIRTH-RATE.

The constitution of the population is altering also through the nature of the reduction of the birth-rate. If careful, scientific, and eugenic birth control were possible, a healthier type might be evolved. What is actually occurring, however, is a greater proportionate reduction in the number of births among the better types of the race than among the less satisfactory. This results in a mental and physical disadvantage to the race as a whole.

Recent reports of the Board of Control show that the proportion of mental defectives in the population has increased approximately from 4 to 8 per 1000 in 25 years, and this fact is only partly explained by such reasons as better ascertainment and notification of the mental defective. Birth control is at its minimum among these people, and they seem especially fertile. Although it is sometimes asserted that heredity accounts directly for a relatively small proportion of mental defectives there is also indirect influence. In my own limited experience of such cases the parents are mentally defective in about 14 per cent., and on the borderline in another 16 per cent. or more. The descendants of these people, if the direct influence of heredity is escaped, are often permanently damaged mentally and physically by the consequent evil environment of their early life. Persons with a tendency to mental defect react very readily to environment, the mental defective being usually amoral rather than immoral.

If the present course of birth reduction continues, as it probably will do, we are nearing the time when the already diminishing natural increase of the population —that is, excess of births over deaths—will disappear entirely. The annual rate of increase by excess of births over deaths per 1000 living, which was over 14 50 years ago, and about 12 at the end of the last century, in 1928 was 5, and in 1929, 2·9. In the present difficult circumstances this may be satisfactory, but in venturing rightly or wrongly to interfere with the course of nature by birth control it is certainly essential to take care that in reducing the quantity of our available supply for the future of the race, we at all events endeavour to preserve the quality of the remainder.

FACTORS UNFAVOURABLE AND FAVOURABLE.

An alteration in the constitution of the population connected with the great decrease in infantile mortality has been caused by the survival of a large number of children who would otherwise have died. A selection depending on ignorance and neglect, however, is not a natural selection, but a very artificial one. Moreover, the enlightened preventive treatment which has resulted in so much saving of infant life has necessarily brought up the standard of life of infants generally.

Accidental deaths occurring in dangerous occupations, the migration of good types of individuals to other countries, unemployment, the development of unfavourable habits largely connected with diet, liquid and solid, are among the factors which affect the public health adversely. On the other hand, the good effects of education are to be seen in the improved condition of the elementary school-children, the increased importance attributed to physical training and open-air life, and the improvement of sanitation and housing conditions among the population as a whole. If the lay press, with its enormous circulation, would reproduce in popular form such definite facts as are to be found in the reports of the Ministry of Health and of the Medical Research Council, the progress would be more rapid. Sensational accounts of so-called cures for such diseases as cancer and tuberculosis do real harm. The hopelessly contradictory nature of advice so freely given as to eating and drinking prevents much notice being taken of it.

The Medical Profession and Public Health.

As regards the influence of our own profession on the future of the public health, we can be optimistic. Medical practitioners, in accordance with their traditions of progress, are taking an increasing interest and a greater part in preventive medicine than at any previous period. Thanks to the work of our Association, the spirit of friendly coöperation between the branches of the profession has steadily grown, and artificial barriers have been removed. In recent years there has existed a small committee of eminent and representative leaders of the profession to confer with the Ministry of Health on public health matters should occasion arise. General practitioners and medical officers of health coöperate in their work more and more as years go on. In this county borough, as in many others, there are quite a number of practitioners who, in addition to the preventive work carried on in the course of their own private practices, are giving valuable assistance in the public health service.

In its early days the public health service and the activities of the medical officer of health were almost entirely confined to the environmental circumstances of disease, a few infectious illnesses, and the application of discoveries that had been made in connexion with such essentials as pure air, pure water, and pure food. These duties of the medical officer of health are as important as they ever were, but new obligations have brought him into constant touch with members of the public as suffering individuals. This has arisen very largely from the number of persons, especially children, found to be suffering from defect, who for various reasons, especially want of means, received very little, if any, medical attention. It was found impossible to adhere to the principle that our duty should end when we had directed the sufferer or his guardians that the necessary medical services should be obtained, for though the advantages of the agency of the general practitioner for carrying out treatment were obvious, this was frequently not available.

The original allocation of large clinics in connexion with the public health service to men and women not long from their training schools was due to the obvious necessity for organisation and freedom from other calls on their time. These points could be secured with full-time clinic officers, but could not be obtained from those in practice. Though the preventive work of the general practitioner is by no means dependent on any work he may carry out in State clinics, modifications which enable him to take part in the treatment of patients in the State clinics are so clearly advantageous that there are signs of this coöperation being more developed in the future. On the one hand, the patients themselves are entitled to the benefit of his varied experience if this can be arranged, and on the other, the experience to be obtained from these clinics would be most valuable to him in his other work. The clinics, which have been an important factor in the improvement of the public health, would be even more useful if they could be coördinated with an increased general practitioner service in the homes of those not in a position to obtain that service at the present time. Early tendencies require skilled guidance, and environment requires skilled supervision; if these could be secured in the home, clinics for treatment would be less necessary.

It is essential that all ill-health should receive attention, and the B.M.A. scheme to extend facilities for treatment beyond the present insured persons is therefore of the utmost importance, and should receive careful consideration. The alternatives to a scheme on these general lines are either that nothing should be done for many sick people—and this is unthinkable—or that the arrangement of medical services should be made by laymen, and this would be most unsatisfactory for both the public and ourselves. It has been pointed out that if the best results are to be obtained it is important that in any form of clinic, contract, or insurance practice the relation between doctor and patient should remain as nearly as possible similar to that in ordinary practice.

While efficient diagnosis and treatment will always remain essential parts of preventive medicine, the improved arrangements now made for extending teaching in the subject of public health at the medical schools are extremely important. The General Medical Council has ordained that courses of instruction in forensic medicine, hygiene, and public health should be taken concurrently with the later stages of clinical instruction, and is still considering details. Public health has hitherto been a subject very detached from the other subjects of the curriculum. This arose from the also very detached nature of the original work of medical officers of health. As far as I am aware, the teaching of the subject of public health to students of medicine has reached its greatest elaboration in the McGill University. In the curriculum of this university the course of public health and preventive medicine has been divided so that in future a portion will be taken in each of the five years of the general course, and brought into close relation with the other work of the medical student in the corresponding year.

POST-GRADUATE STUDY.—AUXILIARY SERVICES.

In connexion with education, the facilities for post-graduate study are rapidly increasing. I would suggest that some simple extended opportunities could be made as a supplement to the present work and to the important scheme which is now in course of development. The work of the general practitioner is very largely concerned with minor ailments of children, maternity and child welfare, tuberculosis, and venereal diseases. There are clinics for these in abundance all over the country, and many more of them could be made available for instructive conference and consultation. The closer coördination of research work with clinical practice is essential.

The want of general application of existing knowledge is one of the many reasons for consideration of the scheme for extending the present limited opportunities of the medical practitioner to get into the homes for early advice and treatment. Since the study of physiology is an important part of the doctor's training, and needs special application to the individual from the time of birth, and before, I wonder if so much abandonment of so-called normal midwifery by the general practitioner is advisable. The only capable judge as to what is normal or abnormal in the working of the human mechanism must essentially have a good knowledge of physiology. The death returns show that the first week is the most dangerous period of human existence, and it must be beneficial to have the advantage of the doctor's knowledge from the earliest start of life.

An important indication of progress is the attention that is being given to bringing auxiliary medical services within the reach of an increasing number of the population. This is particularly the case with regard to consultant and specialist services. One of the latest of these is a scheme to make the valuable aid of pathological examinations available for those of moderate means. These developments are largely due to the activity of our Association, whose schemes also for the extension of medical services generally, and for improved midwifery services and hospital arrangements, require earnest consideration in connexion with the future of the public health.

It is necessary that members of the medical profession should take a leading part in the consideration of social conditions and ameliorative measures, for any matter that may affect the health must concern the profession. The presence of medical men and women in Parliament, on local government bodies, and in associations and societies that have any bearing on the subject of public health is therefore most advisable.

One of the methods, and not the least important one, of attaining the end we have in view—namely, the better health of the community—is by meetings such as the annual meeting of the British Medical Association, with its numerous scientific sections and social opportunities for interchange of knowledge and for debating the means of increasing and applying it.

LONDON HOSPITAL: ANNUAL REPORT.—Last year in-patients increased from 13,347 to 13,613, but the number of out-patients fell from 89,072 to 86,554. The fall is explained by the new arrangements made with the London County Council for the treatment of venereal diseases cases and to the greater use made at the instance of the house committee of the panel treatment of minor and trivial cases. The accounts show a deficit of £22,932, which would have been greater but for savings made by the general fall in the prices of provisions. Subscriptions and donations fell by £6525, but the Hospital Saving Association increased its contribution by nearly £2000. More than a quarter of the in-patients were members of the association, while nearly three-quarters of the total number of patients contributed, directly or indirectly, towards the cost of their treatment and maintenance. The amount so provided was £52,748, representing approximately 25·30 per cent. of the total income. The average cost per week and per inmate was £5 10*s*. 3*d*. and £14 0*s*. 5*d*.

GASTRO-PHOTOGRAPHY.

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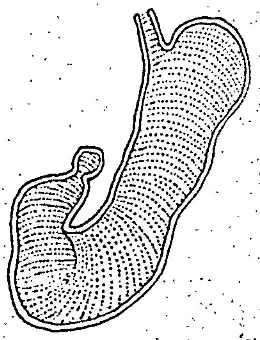
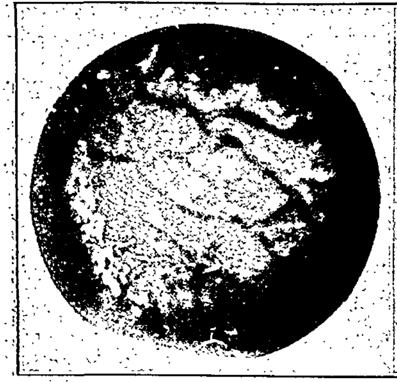
DIRECT inspection of the interior of the stomach by means of the gastroscope, as a generally applicable clinical method, would seem to be an unattainable ideal. With such instruments as we possess gastroscopy can never become a routine procedure. In many individuals it is associated with an unjustifiable risk. The difficulties to be overcome to make it safe are so apparently insuperable that it is no wonder that efforts have been diverted to the problem of obtaining a photographic image in substitute. Yet this itself has raised questions of extraordinary complexity, and only quite recently has a certain measure of success been achieved by the inventive genius of F. G. Back, an Austrian engineer, working in Prof. Wenckebach's clinic in Vienna, with Prof. Otto Porges and Dr. J. Heilpern. An instrument has been made which will, under conditions, give images of a large part of the stomach and the use of which is as free from danger as the passage of an ordinary stomach-tube. The gastro-photor, as the instrument is called, is a magnificent example of the application of the resources of science to a difficult and intricate problem. The object of this communication is to examine critically the possibilities of the device in clinical medicine,

FIG. 2.



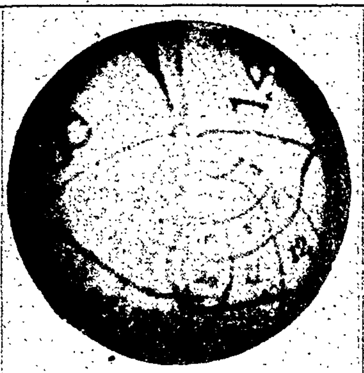
To show the shape of the air-distended stomach and how the antrum turns backwards at an angle to the general direction of the rest of the stomach.

FIGS. 1



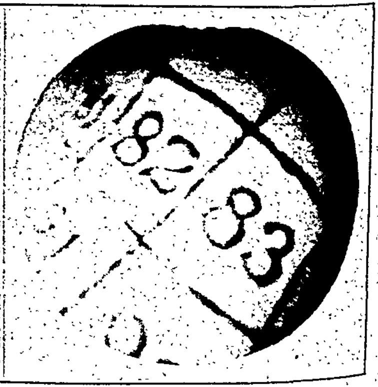
Photograph of the anterior wall of the stomach to show the definition which can be obtained with the gastric camera.

5



Lower antral picture of the cast.

6.



Lower ventral picture of the cast.

Some Fundamental Properties of the Apparatus.

To carry out any useful investigation with the gastrophotor it is essential to have an understanding of the essential principles of the apparatus and its physical possibilities. Its description has already appeared in several publications.[1] It suffices to say here that in its latest form it consists of two groups of four stereoscopic pinhole flashlight cameras, in each of which individual cameras face directions at right angles to each other, whilst being in the same horizontal plane. The two components of each stereoscopic camera are placed one vertically above the other. The angle of vision of each camera is so wide that it is possible to obtain images comprising the whole circumference of an enveloping container over a zone whose vertical width will depend upon the distance of its inner wall from the camera. The horizontal groups of cameras are placed with the nearest pinholes 30 mm. vertically apart, so that the two vertical zones also overlap unless the containing walls are very close to the pinholes. The images on the films are only 5 mm. in diameter, the enlarged prints from them have a diameter of 7·5 cm. But so brilliant is the flash and so sensitive the fine grained emulsion of the film, that it is possible to obtain prints of the definition shown in Fig. 1. However, the definition of the image depends to some extent upon the distance of the object from the pinhole. It falls off with increasing distance. The angle of the vision of the camera being so wide it naturally follows that the image of any particular object shrinks very quickly as it recedes from the pinhole, a fact necessary to keep prominently in mind in the interpretation photographs. The intensity of the flash has bee arranged to give a good exposure at the averag distance the stomach walls must be away from the pinholes to give pictures of a size which can be read and deciphered easily. It can be readily discerned how unfavourably the law of inverse squares acts in the case of the more distant areas of the stomach, which, unfortunately, often comprise just those areas the clinician would wish to inspect. Not only is definition poor and the image excessively small, but the illumination is nothing like the optimum to give the correct photographic exposure.

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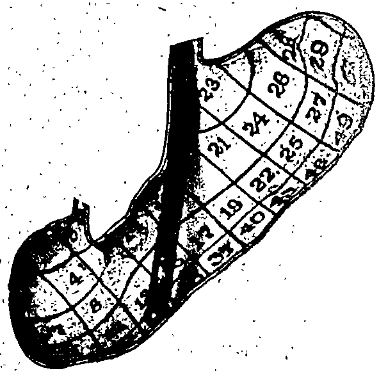
[1] Heilpern, J., and Porges, O.: Klin. Woch., 1930, ix., 15; THE LANCET, 1931, i., 1371; Presse Méd., 1931, No. 31, p. 577.

When the camera is placed properly in the stomach the pinholes of each group of cameras look forwards, backwards, to left and to right. The images obtained are described as upper or lower ventral, upper or lower dorsal, upper or lower fundal, and upper or lower antral.

FIG. 3.



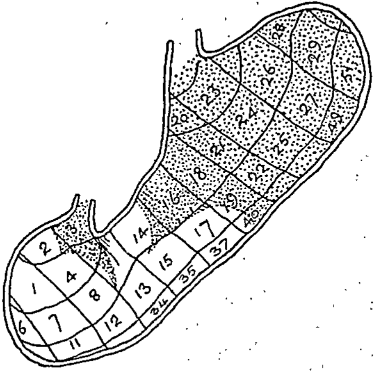
Photograph of the posterior half of the model of the stomach with the camera in position.

Suitability of the Camera for Photographing the Stomach.

The shape of the stomach differs very considerably in different people, as shown by X ray examination after the ingestion of an opaque meal. But the shapes thus revealed do not correspond with the air-inflated viscus which is photographed. The stomach, distended with air, approximates more to the shape of the organ described in the older anatomy books. In general it is to be considered as consisting of a large reservoir lying vertically or diagonally in the coronal plane of the body with a smaller antral portion which, as a rule, tends to turn backwards towards the spinal column (Fig. 2). The œsophagus passing into the stomach bears a little to the left, but a tube entering the cardiac aperture tends to be rather close to the lesser curvature. This can be seen very clearly in X ray photographs of the inflated stomach taken with the tube in position. In the diagrams (Figs. 7 and 8) it is seen that the camera cannot possibly give an image of that part of the lesser curvature, near the pylorus, and that in such a case the pylorus itself is not visible. This is one of the drawbacks of the apparatus; in but few cases can the pylorus and the whole of the lesser curvature be photographed.

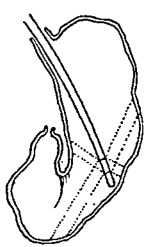
To get some idea of the general field of view covered a cast of an inflated stomach was taken. A mould prepared from this was split into anterior and posterior halves. The inner surface was then marked out into square inches, which were numbered. The camera was used to photograph the inside of the model. Fig. 3 is a photograph taken with the ordinary camera of the posterior half of the model with the telescopic camera in position. Fig. 4 is a drawing the shaded areas of which are those parts of the stomach of which images could not be obtained. More interesting than this, however, are the reproductions of the actual photographs, of which two are shown in Figs. 5 and 6. They are the lower ventral and the lower antral pictures. It is interesting to compare the sizes of the squares in the ventral photograph, where the camera was near the model wall, with some of the squares in the antral region. They are all of the same dimensions. The photographs also show what definition we may expect when contrasts are as great as black print upon a white ground. If we look at the lower antral photograph we see the brightly illuminated arch of the lesser curvature with the larger sized images contrasted with the more dimly lighted small imaged squares of the part of the antrum forming the greater curvature. The actual pylorus is invisible. It is unfortunate that we do not see any more of the lesser curvature, and that the definition of the pyloric region of the stomach fails from small size of the image and poor quality of the illumination. And although the whole area visualised is a large part of the stomach it is not all actually useful as far as practical medicine is concerned.

FIG. 4.



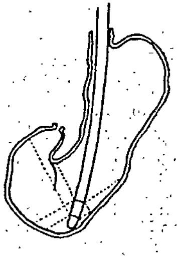
Depicts the area of the cast (dotted) which was not shown in the films when the camera was placed as in Fig. 3.

FIG. 7.



To show how the camera can be withdrawn from contact with the lesser curvature by bending the patient to the right.

FIG. 8.



To show how the camera may be made to advance along the greater curvature and thereby photograph more of pyloric region by bending the patient to the left.

Technique of Gastro-photography.

Though the apparatus has reached such perfection, we have found many pitfalls in the clinical application. Errors can creep in at every stage of the process, so that we cannot yet ensure at will a successful series of prints in every case. The preparation of the patient is important. His stomach must be empty for the examination. If any liquid should find its way into the camera the films will be spoilt. It suffices when the photograph is taken in the early morning to withhold food from the previous evening. In patients with much retention or with hypersecretion the stomach will have to be evacuated through a tube. Ryle's tube is not suitable for this purpose, owing to the small size of the holes, which are apt to be plugged by food remnants. To prevent liquid entering the apparatus during its passage through the œsophagus, a white paraffin wax is plastered into the crevices between the shutter and the camera itself. The introduction of the camera is made much simpler and easier for the patient if the pharynx and larynx be first sprayed with 5 per cent. novocain. This makes not the slightest difference, the prejudice against it being quite baseless. If novocain be used the whole procedure can be carried out with very little discomfort, whereas without it some individuals exhibit an impassable spasm at the entrance to the œsophagus, the attempt to overcome which will cause considerable pain. The camera will pass more easily if its rigid extremity be directed down the œsophagus with the finger. It may be lightly lubricated with the paraffin wax, referred to above, while the connecting rubber tube may be moistened with water. The instrument can usually be felt to pass through the cardiac opening, after which it is pushed on until it comes to rest, held up by the resistance offered by the greater curvature. Air is then blown into the stomach, the patient having been previously warned to signal when he feels distended, at which moment the photograph is taken and the apparatus withdrawn. A good result will not be obtained unless the inflation is sufficient.

X ray photographs of the camera in position show how it lies in the inflated stomach. It is very apt to lie close to the lesser curvature, so close, in fact, that it is not uncommon for no recognisable image to be obtained from the upper cameras facing antralwards. By bending the patient's shoulders to the right it is possible to increase the distance between the lesser curvature and the apparatus (Fig. 7), but this manœuvre will also carry it away from the most favourable position for seeing round the lesser curvature into the prepyloric region of the stomach, for which purpose it is better to have the patient's shoulders bent to the left (Fig. 8). All things considered, it seems more convenient to have the patient sitting up, but his back must not be allowed to sag. The lesser curvature may also be well seen in the left lateral position, with the pelvis and shoulders slightly raised. In the elongated variety of stomach a prolongation is screwed on to the extremity of the apparatus, otherwise, resting on the greater curvature, it would be too far below the lesser curve to get useful pictures.

Interpretation of Photographs.

The extreme variation in the size of images has already been referred to. It is one of the great difficulties of interpretation. It seems, however, that experience in reading photographs will tell here, and it is possible actually to measure the size of an image if a radiogram with the apparatus in position be made at the same time as the gastro-photograph. On the X ray film the image of the camera of known dimensions can be measured and calculations based upon the corrected distance of the object from the pinhole and the known distance of the film from the latter. This can only be an approximation, because the film distance varies somewhat, as the films themselves are not all accurately cut. Nevertheless, it is a useful approximation, and enables us to realise, as do Figs. 5 and 6, that a gastric ulcer, for instance, may have a very different aspect according as it is seen close to or from some distance.

We do not feel at this stage that we can be dogmatic about appearances seen through the eye of the camera. At first the photographs look like meaningless blotches. With increasing familiarity they undoubtedly take on significance. Sometimes, by a trick of vision, depressions have the appearance of projections and by not viewing the photograph as a whole from a sufficient distance we may perhaps fail to appreciate the forward bulging of the posterior wall of the stomach caused by the vertebral column or the bending round into obscurity of the lesser curvature. Much may be learned from the projection of shadows on the gastric mucosa, and the intensity of the illumination in the depths of hollows. The intense whiteness produced by light reflected from the surface of mucus is characteristic. It is helpful to make use of the knowledge of the appearances of the different parts of the stomach obtained by gastroscopy. It enables us to recognise the difference between the folds of the greater and lesser curvatures and other aspects of the mucous membrane. The deviations from this normal—for instance, the drawing together of these folds by cicatrisation round an ulcer—are the features by which abnormalities are recognised.

Conclusions.

It is difficult to assess this new method of gast[illegible] examination at present. It is certainly a great techn[illegible] achievement. It is also certainly sometimes capable of revealing abnormalities which remain concealed by any other method of investigation. Extended systematic study of gastric disorders is required. Light may be thereby thrown upon the different varieties of dyspepsia, the recognition of carcinoma may become possible in some instances at an early stage, before it is possible to discern its presence by other methods of examination. The drawbacks of the method are obvious. It is a highly complicated procedure requiring the utmost care at every step, and in the present stage of development cannot inevitably be made to produce results. It is a time-consuming examination. Only further study will show whether the gain is worth the immense trouble involved. As a means of research it is essential that it should be exploited. Doubtless its field of usefulness will be defined and experience will suggest alterations and simplification of technique. Such a safe method of gaining further knowledge of gastric pathology seems to offer distinct possibilities in the gastric investigation of digestive ailments.

We wish to thank Dr. H. C. Gage for his coöperation in the X ray work and Mr. W. J. Newly, who has been responsible for most of the photographic technical work, and to whose enthusiasm the success is in great measure due. Baron André de Veitschberger has throughout given us his guidance and the fruits of his experience; to him we wish to accord our grateful thanks.

THE DONORS OF FALMOUTH HOSPITAL.—The freedom of the borough of Falmouth has been bestowed upon Mr. William Mountstephen and Mr. Alfred Charles Collins, who between them bore the entire cost of the new hospital at Falmouth.

SOME RESULTS OBTAINED WITH THE GASTRO-PHOTOR.

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THE gastro-photor is an instrument whereby the interior of the human stomach can be photographed. By radiography after an opaque meal it has long been possible to reveal the size and shape of the stomach and any abnormality or irregularity in its outline; with the gastro-photor a permanent and visible record is obtained of the condition of the interior of the organ, though not of its size and shape. It is thus evident that radiography and intragastric photography supplement each other, and the new method may prove of great value in affording definite information in certain cases where radiography fails. The gastro-photor has been available in this country for so short a period that experience in its use is still very limited. The full extent of its powers has yet to be determined, but it is hoped that by its means it may be possible to reveal inflammatory changes in the mucosa, small non-penetrating ulcers, and ulcers about a gastro-enterostomy stoma when present. The reaction of an ulcer to treatment may also be followed and recorded.

Perhaps it may fulfil an even more important rôle. Precancerous changes are well recognised in certain situations; do they appear in the stomach? The relationship between simple ulcer and cancer is still in dispute, but it seems certain that cancer may arise quite independently of an ulcer. Will it be possible to demonstrate the earliest stage of such a growth and thus give the surgeon the best possible chance of eradicating the disease? It is clearly impossible to answer any of these questions at the moment, and the object of the present communication is merely to give some idea of the pictures which are obtained.

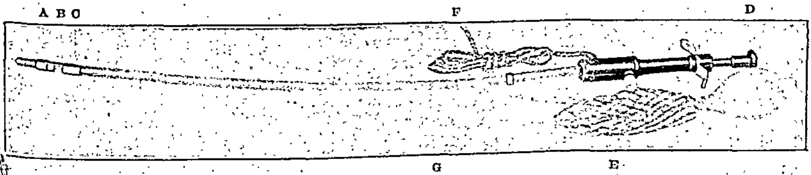
Use of the Apparatus.

The gastro-photor consists of two tubular metal cameras set at the end of an œsophageal tube. Each camera is divided into four compartments, and each compartment carries a photographic film. No lens is employed, but the image is focused on to the film by a pin-hole, which gives a more perfect definition than any lens. Each camera has eight pin-holes, so that each film receives two separate images, and 16 photographs are obtained by one exposure. Between the cameras an electric lamp is inserted and connected, through the œsophageal tube, with a transformer actuated from any electric lighting circuit having a voltage from 50 to 250, whether the current be alternating or direct. The pin-holes are covered by a sleeve moved by a Bowden wire passing up the tube to a handle at the upper end. When the cameras are in the stomach the handle is pushed down, causing the sleeve to uncover the pin-holes; a button on the transformer is immediately pressed, passing a current into the lamp so that the interior of the stomach is illuminated; finally the handle is released, allowing the sleeve again to cover the pin-holes, and the cameras are withdrawn. The whole operation only occupies two or three minutes.

FIG. 1 shows the instrument. A is the lower camera, carrying films 12×8 mm. C is the upper, with films 10×8 mm, so that the films can afterwards be readily distinguished. Between A and C is the lamp B. At the other end is the handle D, pressure on which exposes the films. By means of the bulb E the stomach is inflated immediately before the photograph is taken. The plug F connects the lamp with the transformer. G is a metal ring which slides along the tube to any desired position. The distance between B and G can be measured and then, if the ring be level with the patient's teeth, the situation of the cameras is accurately known.

The actual taking of a photograph is a perfectly simple operation; as with all these methods of examination, *it is the interpretation of* what one sees that presents a difficulty. Even in the most favourable circumstances this must be great until wide experience makes the observer familiar with the appearance of the gastric mucosa, but in the case of the gastro-photor two other factors add to it. In the first place, the negative obtained is only 3–4 mm. in diameter, and has to be enlarged 100 times, entailing more or less unavoidable loss of definition. In the second place a curved surface, the interior surface of the stomach, is focused on to another curved surface, the film in the camera, so that some degree of distortion of the image is inevitable. The two surfaces are curved in opposite directions, concavity towards concavity, which reduces, but does not eliminate, distortion. In spite of everything, however, many of the pictures show much detail, and the more pictures one examines the more detail one discovers in them.

FIG. 1.

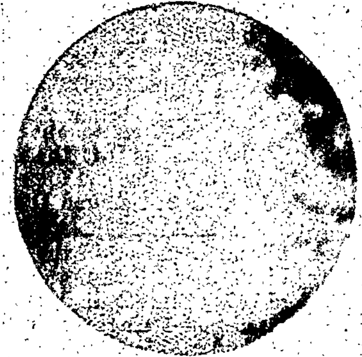


The Photographs.

The illustrations are from photographs obtained from patients at the Cancer Hospital during the past two months. When the work was commenced much valuable advice and assistance was given me by Baron de Veitschberger, one of the co-inventors of the apparatus, who has had much experience with it in America. In examining a picture it will be found that a far better appreciation of its features will be *obtained* if it be held at some distance, 18 to 24 inches, than at closer range.

FIG. 2.—The normal rugæ of the gastric mucosa over the anterior surface of the stomach. Towards the upper part of the picture they are irregular and capped with a small amount of mucus; to the right and downwards they radiate outwards and

FIGS. 2



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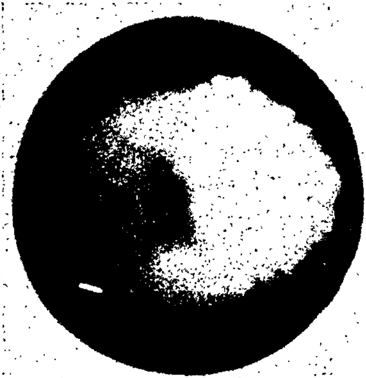

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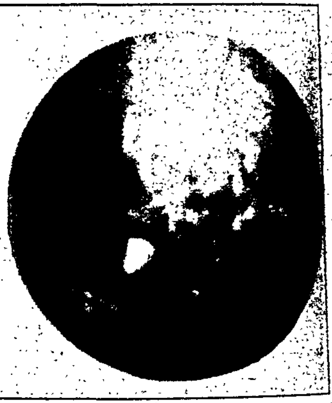


have a matt appearance, owing to the absence of mucus (× 1½).

FIG. 3.—The pylorus, closed. The rounded margins and linear lumen suggest that the sphincter is contracted. There is much mucus on one side. No lesion was discovered in the stomach clinically, radiographically, or photographically (× ⅓).

FIG. 4.—Pylorus seen as it turns backwards beside the spine. One margin appears as a well-defined edge, suggesting that the sphincter is relaxed. At the upper limit of the orifice is a drop of mucus. Above the orifice the normal rugæ present a reticular arrangement. (× 1.)

FIG. 5.—A mass of mucus, containing large bubbles of gas, lying on the posterior surface of the stomach. Compare with Fig. 6. The reflection of light from the surface is much harder; little or none is absorbed. The aspect nearer to the observer is not illuminated, and the large bubble nearest but one to the left casts a definite shadow. The mucus is situated on a surface which, to the left, is curving away backwards. The patient was suffering from gastritis associated with a deeply penetrating ulcer (shown photographically in Fig. 10, and radiographically) on the lesser curvature. (× ⅓.)

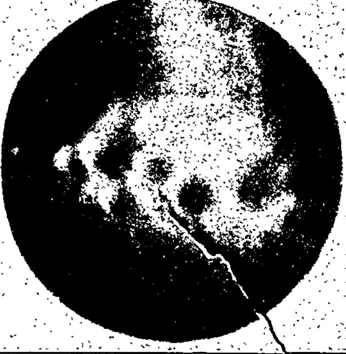
FIG. 6.—A gastro-enterostomy stoma just above and to the left of the centre of the picture. Above, and to the left again, a nodular appearance is seen. The interpretation is difficult. Comparing it with Fig. 5, the two are very similar, but here the reflected light is softer. Possibly the mucosa is swollen and nodular, more probably a plaque of mucus lie alongside the stoma, and with it bubbles of gas ar incorporated. The patient had a gastric ulcer (shown in Fig. 8, and also radiographically). When the photograph was taken it was known that an operation had been performed five years previously, but no until a photographic diagnosis had been made were the notes available, proving that a posterior gastro-enterostomy had been performed at another hospit for a perforated duodenal ulcer. (Magnificati unknown.)

FIG. 7.—Normal rugæ, with droplets of mucus to the right and below. Here the reflection of light is hard and brilliant. The rugæ cast definite shadow but the mucus casts none. From about 8 o'clock fold is seen passing upwards and to the right, dis appearing about 2 o'clock. About halfway it f the lateral soon fading away. Higher up, it forks, and both branches are visible as far as the of the picture. Other rugæ are less easily tinguished. (× 1⅓).

FIG. 8.—Ulcer on the posterior surface. The patient was the same as in Fig. 6. On two separate occasions the ulcer was demonstrated by X rays. It is situated on the posterior surface near to the lesser curvature. It is seen about 2 o'clock in the picture, and there is much mucous exudate round about it. (× 1⅓.)

FIG. 9.—An ulcer on the lesser curvature, surrounded by swollen, œdematous rugæ. Radiograms showed " a small ulcer on the lesser curvature." The

FIGS. 5



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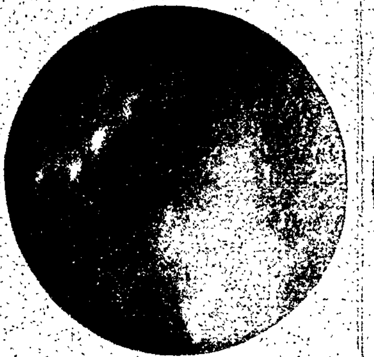

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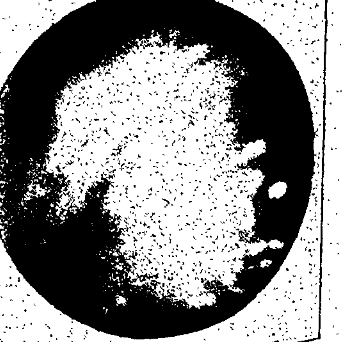
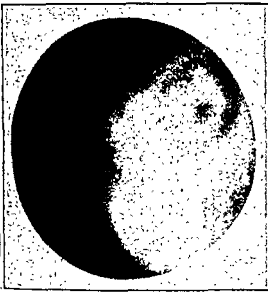


FIGS. 8



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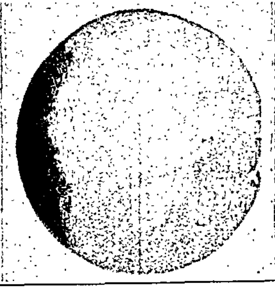

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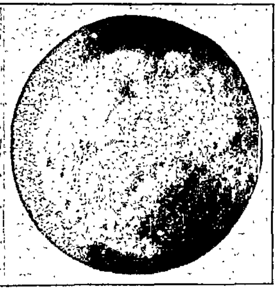


lcer is situated on the lesser curvature, and is seen low and to the right. The mucosa above and to e left presents a rounded, nodular appearance. Magnification unknown.)

FIG. 10.—An ulcer with raised edge partly surounded by frothy mucus. The same patient as in ig. 5. The base is nodular. Below and to the left e wall overhangs and casts a shadow. A spur of wollen mucosa runs upwards and to the left in the wer part of the ulcer. Radiograms show a large, enetrating ulcer. (Magnification unknown.)

FIG. 11.—Two small polyps on the lesser curvature a patient suffering from epigastric pain, nausea, atulence, and loss of weight. Three years ago ll-stones were removed by operation. No radioaphic evidence of any gastric lesion. The polyps e seen as two small, papillary growths placed close ther where light and shadow meet to the left of picture. They have a dull matt surface, and w a shadow upwards. To the right of them ugae are seen. (× ⅓.)

FIG. 12.—Carcinoma of the pyloric end of the tomach. The nodular surface of the growth is vident, as is the curved edge rising from the mucosa longside. Radiograms showed a filling defect. At peration an inoperable cancer was found. (× ½.)

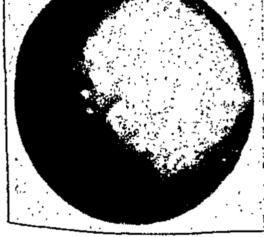
FIG. 13.—Partial gastrectomy performed six months previously. The scar is seen running from ight to left. On the extreme left the wall is in partial shadow, and a number of dark spots are visible. These are probably bubbles of gas in a layer of mucus. (× ⅓.)

As already explained, each film receives two separate images. If one pair of pin-holes lies close to the wall of the stomach the two pictures on the corresponding film will be totally different, representing separate and distinct portions of the gastric wall. If the holes be some distance from the stomach wall the two pictures on the corresponding film will be more or less identical, the similarity becoming greater the greater the distance between camera and stomach wall. A very simple apparatus has been devised whereby it is possible, if the two pictures are at all comparable, to measure the magnification reached. But if the two pictures are different, so that no point on the one corresponds with any point on the other, then no means of determining the magnification is known. Hence in some of the illustrations it is impossible to state the relationship in size between the picture and the part of the stomach wall represented. The less the distance between the camera and the stomach wall the greater the magnification in the final picture, so that those pictures of which the magnification is unknown are probably about, or larger than, natural size.

Comment.

I think that these illustrations are sufficient to show that lesions of the stomach can in fact be reproduced photographically, and that they warrant the hope that in the future the method will be found of definite clinical value. They are selected from the results of examining 31 patients. In none of these was the slightest difficulty experienced in introducing the instrument into the stomach, nor did the introduction

FIGS. 11



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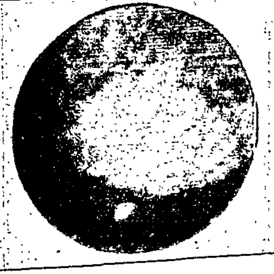

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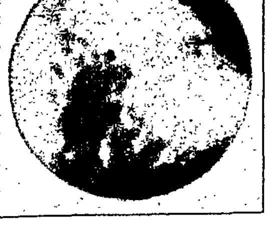

occupy more than a few seconds. Several of the patients have subsequently been examined a second time. No patient has refused a second examination. One lady, not included in the above number, developed a spasmodic contraction of the pharyngeal constrictors immediately the camera reached the base of the tongue, so that although an attempt was made on two separate occasions to pass the instrument both attempts failed. This is the only failure up to the present.

It is a pleasure to record my great indebtedness to Mr. Leslie Smith, of the Radiological Department of the Cancer Hospital, for the time and labour he has devoted to the development and printing of the photographs. To obtain the best results a high degree of skill and experience are essential. I also thank Prof. J. M. Woodburn Morison, director of the department, for placing Mr. Smith at my disposal.

COMPLETE AND PARTIAL HEART-BLOCK DURING AN ATTACK OF RHEUMATIC FEVER.

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Delayed conduction down the auriculo-ventricular bundle, as shown by a lengthening of the P–R interval, is not very uncommon in the course of acute rheumatism; a higher degree of block, giving rise to dropped beats or 2 : 1 response, is less common, and complete heart-block is rare. The following patient is therefore of interest, especially because of her complete recovery.

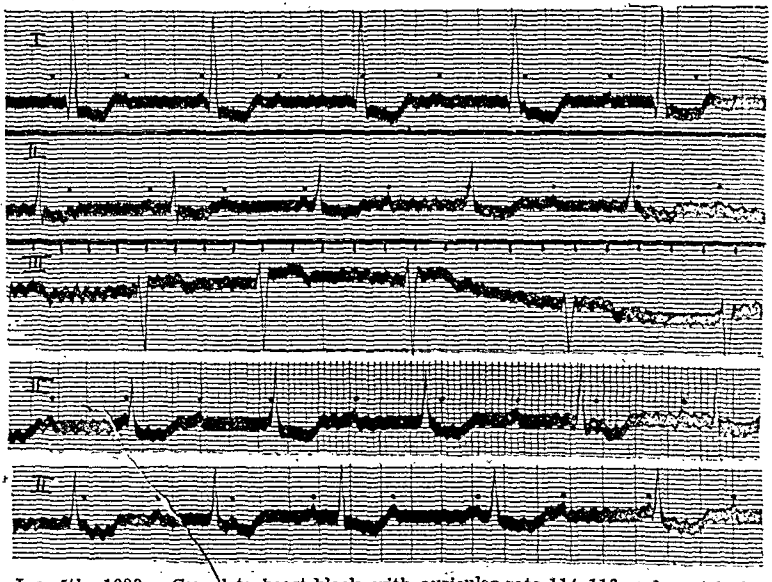
She had rheumatic fever when 12 and again when 14, and came under observation with her third attack in 1925, when 25 years old. Pyrexia persisted for ten days, and after three weeks there was still pain and swelling of the joints in spite of treatment with salicylates. The heart was enlarged to the left; in the aortic area there was a diastolic murmur which was conducted to the apex; there were no signs of mitral stenosis. Radioscopy showed enlargement to the left, typical of aortic disease, without any dilatation of the auricles or right-sided enlargement to suggest mitral stenosis. The average blood pressure was 125/60. She rested in hospital for six months. During the next three years she was able to do easy housework, and generally seemed rather better when taking tincture of digitalis, 30 minims daily.

On Dec. 16th, 1928, she was readmitted for pains in the joints; her temperature rose to 102° F. and her pulse-rate to 140. On the 21st her pulse was noticed to be slower and irregular; it felt like frequent dropped beats alternating with runs of extrasystoles, but actually these were the short periods when the ventricle was responding to each alternate beat, or to each beat of the rapid auricle. Since admission she had been taking daily 20 minims of tinct. digitalis, which was at once stopped and not again given. At the end of the month she seemed better, with no pyrexia and little pain; the pulse continued irregular.

On Jan. 1st, 1929, the pains returned and her temperature rose to 101°, but the pulse became more regular, the rate falling to 50–60. On the 5th, her temperature having fallen to normal, an electrocardiogram showed complete heart-block (Fig. 1) though the ventricular rate was about 60 and [illegible] little more than half the auricular rate. The joint pains persisted without further pyrexia till about the middle of the month. The Wassermann reaction was negative and there was nothing to suggest that she had suffered from a syphilitic infection.

On Jan. 11th, when the pulse had become faster and irregular, an electrocardiogram showed short runs of partial heart-block with the P–R interval lengthening until there was a dropped beat, followed by 2 : 1 heart-block for a few beats, when the [illegible] was repeated (Fig. 2)—e.g., in one case the [illegible] intervals in seconds were 0·16, 0·20, 0·20, 0·20, [illegible] no response, 0·16, no response, 0·16, &c. There was no significant change in the electrocardiogram on Jan. 21st and on Feb. 9th. The auricular rate was generally a little over 100 and the ventricular rate varied each few seconds from 50 to 100. On Feb. 28th the pulse-rate was regular, just over 60 with constant 2 : 1 block, which could hardly have been diagnosed even from the electrocardiogram except by comparison with previous and subsequent records. On March 3rd there was a slight return of pain and the temperature rose to 102°, but it fell to normal on the fourth day and there was no further pyrexia. In April she was allowed up on a couch, and in May went away to a convalescent home. Electrocardiograms in March and April still showed irregular 1 : 1 and 2 : 1 block, the auricular rate being about 100–120 and the ventricular rate about 70.

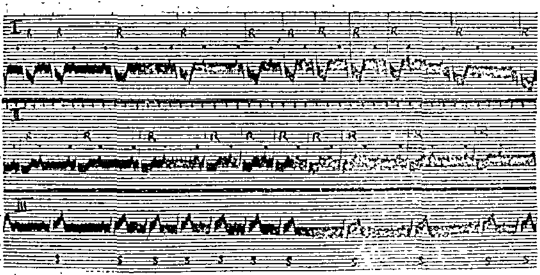
Fig. 1.



Jan. 5th, 1929. Complete heart-block, with auricular rate 114–116 and ventricular rate 62·5. Lead II. is here shown three times. In this and Fig. 2 the dots mark the auricular P waves. The time marker shows fifths and twenty-fifths seconds.

She returned home in July and was then able to walk to hospital. Rather to my surprise, all signs of block had disappeared and her

FIG. 2.



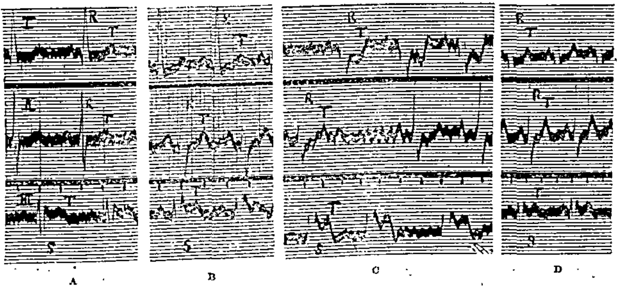
Jan. 11th. Short alternating runs of 1 : 1 and 2 : 1 heart-block—auricular rate 107. Note increasing length of P–R interval where there is 1 : 1 response, and inversion of T waves, completely in lead I. and partially in lead II.

condition seemed much the same as a year before (Fig. 3 D).

In addition to the changes in the P–R interval there were striking changes in the T waves which provided further evidence of myocarditis. Before this attack the T waves were just upright in lead I., upright in lead II., and atypical but upright in lead III. (Fig. 3 A and B). Apart from minor digitalis effects there had been no changes for two years. In January, 1929, when she had heart-block the T waves were deeply inverted in lead I., slightly inverted in lead II., and more upright but atypical in lead III. (Figs. 1 and 2). At the end of January T was partly upright in lead II. (Fig. 3 C); by February it was definitely upright, and T in lead I. was less inverted, being now biphasic. In April there had been no further change and T was still as much inverted in lead I., but in July and August there had been a complete return to the normal upright waves, just as before the attack (see Fig. 3 D). It is most usual for inversion to occur in lead I. where there is preponderance of the left ventricle, as there has been all the time in this patient. An orthodiagram taken in October, 1930, shows some enlargement of the heart to the left without evidence of mitral stenosis. There was no appreciable change from 1926.

The patient has since remained well and is now (May, 1931) able to do as much as before this attack of rheumatism. Frequent electrocardiograms since have always shown a normal P–R interval. She has, therefore, made a good recovery although complete heart-block was present for some days, and partial heart-block for some months, during and after her fourth attack of rheumatism. It is in accord with general experience that heart-block is more apt to occur in cases with disease of the aortic valve.

FIG. 3.



Electrocardiograms before, during, and after her fourth attack of rheumatic fever. (A) February, 1927, (B) February, 1928, (C) Jan. 21st, 1929, and (D) August 5th, 1929. Figs. 1–2 were obtained in the interval between (B) and (C). Note that the P–R interval in (D) is of normal length in spite of the presence of block previously. Note also the inversion of the T wave in lead I., with subsequent recovery (see text).

CLINICAL AND LABORATORY NOTES

APLASTIC ANÆMIA.

SEQUEL TO A CASE REPORT.

BY A. G. GIBSON, M.D. OXF., F.R.C.P. LOND.,
PHYSICIAN TO THE RADCLIFFE INFIRMARY, OXFORD.

THE case history of the patient with aplastic anæmia published in THE LANCET (1926, ii., 948) under the title of The Action of Adrenalin in Aplastic Anæmia aroused some interest, and it is important that the subsequent history should be put on record.

The patient was a girl of 11 who, in the spring of 1923, began to suffer from bruises in various parts of the body, for which no origin could be ascertained, and she was paler than normal. A diagnosis of aplastic anæmia was made. She was given seven transfusions during a period of 19 months and, from a time when she appeared almost certainly to be failing rapidly, with hæmorrhages in various parts of the body, daily injections of adrenalin produced an apparent and startling recovery. Her history was traced at that time for 16 months after the treatment with adrenalin had begun, during which time she had been able to take her part in ordinary life, though the blood count was persistently abnormal. The last blood count for which there were complete figures at that time, in July, 1926, showed 3,490,000 red cells, 72 per cent. of hæmoglobin, a colour-index to 0·95, and 4680 white cells. The differential count (per cent.) was: polymorphs, 32·5; small lymphocytes, 45·5; endothelials, 16·5; eosinophils, 0·5;

neutrophil myelocytes, 4·0; eosinophil myelocytes, 0·5; large lymphocytes, 0·5.

From the end of 1926 until her death on April 30th, 1931, she was continuously on adrenalin, with one brief interval. Her general appearance was that of a slightly built young woman with a just noticeable pallor, and a slight darkening of the skin of the face. Her weight, which was 6 st. 8 lb. in September, 1926, rose with slight intermissions up to 7 st. 1 lb. in February, 1931. She was fairly well nourished, and the skin, especially over the abdomen and to a lesser extent over the chest, presented a marked generalised pigmentation. Two deeper patches were present on the back, but they had been present before the illness. There was no pigmentation of the mouth nor any intense pigmentation of those parts subjected to slight irritation, such as the axillæ and waist. At no period was the pulse rapid, the blood pressure remained normal—about 120 maximum and 80 minimum—though on one occasion the maximum was 140. The heart was never found enlarged, and no murmurs were ever detected. The abdominal organs were also normal; neither liver nor spleen was enlarged during any occasion on which she was examined subsequent to 1926, and there was never anything abnormal in the urine. Menstruation had remained regular, though on occasions it was scanty and shorter than it had been.

On no occasion—except that to be referred to—was there any return to the hæmorrhagic condition from which she had previously suffered. "Bruises" were indeed occasionally noticed though, since she was an active person, a slight injury could not be excluded. Though for the most part she led an active existence in the country, and was able to walk and swim as well as other girls of her own age, she could not stand the burden of a post in London with light duties which she tried to take up. She never appeared fatigued, and was never unusually breathless when at home.

In March, 1930, her condition was more or less stationary; she was in good health, apart from the anæmia, and it was thought desirable to give up adrenalin in order to see whether she could do without it. After 12 days she had two slight nose-bleedings, and a third subsequently, much slighter, after the adrenalin was resumed. The opinion of her parents was that it was not wise to give up the adrenalin. She had not, however, felt unwell as a result of leaving it off.

She had occasional colds. In 1929 she suffered from an attack of diarrhœa and was two days in bed, and it was not generally thought that she had any specially lowered resistance to intercurrent febrile disease. In the last four days of April, 1931, however, she contracted chicken-pox from another person, and the rash, which was typical in distribution and character, on the third day became hæmorrhagic. There were sores round the mouth, extreme fœtor of the breath, with gangrene of the gums, and dysphagia set in 18 hours before death. Hæmorrhage occurred from the bowel, and there was some blood in the urine. She relapsed into a muttering delirium. Two gangrenous patches appeared on the back. Before this, however, there had been several attacks of excruciating pain in the back, requiring morphia. This pain was not located to any function, and its anatomical origin could not be determined. She died on the fourth day of the disease.

The condition of the blood had remained practically at the level that was reported before. In all, 25 blood counts were taken between September, 1926, and February, 1931. The average of these is as follows: red cells, 3,020,000; hæmoglobin, 64 per cent.; colour index, 1·6; white cells, 2700. Differential count: polymorphs, 27 per cent.; lymphocytes, 56·7 per cent. Taking the hæmoglobin as an indication of the anæmia, there was a tendency to fall as time went on. The average hæmoglobin of the year's counts is as follows: 1927, 60 per cent.; 1928, 50 per cent.; 1929, 66 per cent.; and 1930, 58 per cent. The last hæmoglobin percentage recorded was 56 per cent. The halometer reading (Eve), which is an indication of the size of the corpuscles, showed no significant variation from the normal. Microscopically there was usually some evidence of activity of the bone-marrow in the presence of anisocytosis and polychromasia. Now and then immature cells, such as neutrophil myelocytes and large lymphocytes, were present in the differential counts. Platelets were usually present, but in small numbers (not counted).

Numerous attempts have been made to ascertain the causation of the anæmia, both from the history and by giving drugs. Her residence in India, and indeed the diagnosis of malaria made in that country, appeared to suggest that disease as the initial cause. Treatment by quinine, however, has never made any difference that could be estimated, and there have been no attacks of fever such as could be attributed to that agent.

The conclusion appears to be that, through some unknown cause, the blood-forming organs had been partly destroyed, leaving the patient with sufficient for a modified existence when constantly stimulated by adrenalin, but that, without the adrenalin, the bone-marrow activity was insufficient to prevent the tendency to hæmorrhage. During the greater part of her life, since the adrenalin was started, there was no special lack of resistance to infections, but this lack of resistance was unmasked or induced by the attack of chicken-pox which brought back the hæmorrhagic tendency in its former violence.

TREATMENT OF HABITUAL ABORTION WITH WHEAT-GERM OIL (VITAMIN E).

By P. Vogt-Möller, M.D.

(*From the County and City Hospital, Odense, Denmark*)

The existence of a fat-soluble antisterility vitamin—vitamin E—must now be considered established. Papers on this vitamin up to the year 1927 are reviewed in Evans and Burr's monograph[1]; I would, however, mention here that the first information about such a vitamin is due to Evans and Bishop.[2]

Vitamin E is found in certain vegetable oils, chiefly in wheat-germ oil, but also in many other oils of vegetable origin. Sure,[3] for instance, found it in crude maize oil but not in the commercial product of maize oil; it is also to be found in plant leaves—e.g., of lettuce. Little or no vitamin E is found in animal substances; it is, for instance, not found in cod-liver oil.

As yet the importance of vitamin E to the organism has only been elucidated in detail for rats. Beard,[4] however, has proved that mice, too, need vitamin E. The sterility occurring when this vitamin is lacking in the food is of a different pathogenesis in the two sexes. In the male the vitamin seems to play a part in spermatogenesis, histological changes of the testes being found in avitaminosis E, especially a more or less marked degeneration or even complete disappearance of the spermatogonia. In the female, on food free from vitamin E, ovulation and implantation take place normally, the reproductive system being unimpaired, and the sterility being due to the fact that the implanted ova are resorbed at an early stage of the pregnancy. In male as well as in female animals vitamin E may be stored to a certain extent.

In 1927 Evans and Burr[5] [6] showed that various fats—e.g., lard—when mixed with vitamin E (wheat germ or wheat-germ oil) were capable of depriving the latter of its value as a vitamin; this vitamin-destroying property of the fat increased with its rancidity, and Evans and Burr[7] drew attention to "the possibility of destroying vitamin E by the development of rancid substance in wheat-germ oil itself," and calls to the importance of using fresh preparations. Without going into further detail as far as researches of recent years are concerned, I need only refer to McCollum and Simmonds's[8] and Jackson's[9] monographs, and to Cummings and Mattill's[10] work.

The preparation used as the source of vitamin E in the cases mentioned below was wheat-germ oil; by the courtesy of Miss M. H. Roscoe, of the Lister Institute, London, the wheat germs used—a very pure preparation—were delivered by Messrs. I. and H. Robinson, Ltd., Deptford Bridge Mills, London, and the wheat-germ oil was made from the germ in the manner described by Vogt-Möller and Bay,[11] [12] and Vogt-Möller.[13] According to Evans,[14] wheat-germ oil only contains minimal amounts of vitamin A.

The dose of wheat-germ oil necessary for rats is only a few drops daily, and, according to Evans and Burr,[1] vitamin E (wheat-germ oil) is efficacious both on enteral and parenteral application. That wheat contains toxic elements when extracted in ether, as was maintained by Hart, Miller, and McCollum,[15] and by Hart, McCollum, Steenbock, and Humphrey,[16] has been thoroughly refuted by Osborne and Mendel,[17] and all researches of recent years.

As I had worked for years on the question of vitamin E and reproduction in small experimental animals (rats and mice) without reaching any essentially new conclusion, but confirming Evans and Burr's investigations in every respect, it was natural for me to try its effects in veterinary medicine. Vogt-Möller and Bay[11] [12] obtained favourable results in the treatment of sterility in cows with wheat-germ [illegible]; from this treatment to the treatment of habitual abortion in women there was only one step. Since treatment with cod-liver oil, as suggested by Poulsson,[18] and with Vigantol, as recommended by Novak,[19] had to be considered as contraindicated from an experimental point of view in habitual abortion, cod-liver oil being capable of causing abortion in rats when administered in excess (as shown by Hartwell[20] and Sure[21]), I tried wheat-germ oil, which in both cases led to the desired result—viz., a pregnancy with a normal course and a healthy viable child.

CASE 1.—The patient was a married woman, aged 24, who, apart from the ordinary diseases of childhood, had always been in good health and had menstruated normally since her thirteenth year. Both she and her husband were healthy and sound, and in both of them the Wassermann test was negative. The patient had aborted four times after absence of menstruation for seven to eight weeks. She came under treatment six weeks after the last menstruation, and on examination an enlarged—and in all probability pregnant—uterus was found, but otherwise nothing abnormal. The diagnosis of pregnancy having been further substantiated by a positive Zondek-Aschheim reaction, a treatment with wheat-germ oil by mouth was instituted, 5 c.cm. being given once a day during the first fortnight, then 5 c.cm. every second day for the next fortnight, and then 5 c.cm. every sixth day. Throughout the pregnancy the patient was quite well, and at term she was delivered of a healthy girl, weighing 3260 g., who is doing well. The placenta was of normal appearance. The treatment with wheat-germ oil did not cause any inconvenience.

CASE 2.—The patient, aged 20, had been married for six years. She had had the ordinary children's diseases and had menstruated regularly since her fourteenth year. At the age of 16 she had had acute appendicitis, and an appendicectomy had been performed. At the age of 25 she passed through a normal labour; the child, a boy weighing 3400 g., is in good health. The patient then became pregnant five times, but aborted each time in the third or fourth month. The abortions were quite spontaneous each time, no interference being made. Both the patient and her husband were healthy, and the Wassermann test was negative in both. During the last pregnancy when the patient came under treatment in the seventh week, a course of treatment with wheat-germ oil, consisting of 5 c.cm. by mouth daily for a fortnight, was instituted; then 5 c.cm. was administered every sixth day during the remaining period of the pregnancy. The patient showed a good toleration to the treatment, and at term a healthy girl weighing 2900 g. was born; the child is in good health.

The diet of these two patients did not deviate from the ordinary food taken in Denmark; it can hardly have been poor in vitamin E, but possibly the need for this vitamin varies in different individuals, so that a hypovitaminosis E may have been present in the above cases. The material, however, is too scanty to allow us to base anything decisive on it, but nevertheless it will presumably be inferred that vitamin E preparations may be of therapeutic value in the treatment of habitual abortion in women.

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A CASE OF XEROSTOMA AND XEROPHTHALMUS.

By JAMES L. O. TILLEY, M.R.C.S., L.D.S.R.C.S. ENG.

A MARRIED woman, aged 34, with no children and a good family history, had suffered during childhood from epistaxis and "nervous coryza" and at the age of 15 from profuse sweats, which were particularly associated with mental agitation. At the age of 21 she had had diphtheria, followed by paresis of the soft palate. For these complaints she had received X rays (for the sweats) and cauterisation of the nose (for the epistaxis and nervous coryza). The treatment was stated to have been beneficial. Her general physical condition was normal. She was highly strung but there were no symptoms of neurasthenia or hypochondria.

On June 29th, 1925, the patient was subjected to severe mental agitation and strain. A fortnight later, whilst driving to her home, she suddenly became aware that she was unable to articulate and could only swallow with difficulty until she was able to moisten her mouth and throat with water. At this time she "suffered great mental agony." This neutrophil myelocytes, 4·0; eosinophil myelocytes, 0·5; large lymphocytes, 0·5.

From the end of 1926 until her death on April 30th, 1931, she was continuously on adrenalin, with one brief interval. Her general appearance was that of a slightly built young woman with a just noticeable pallor, and a slight darkening of the skin of the face. Her weight, which was 6 st. 8 lb. in September, 1926, rose with slight intermissions up to 7 st. 1 lb. in February, 1931. She was fairly well nourished, and the skin, especially over the abdomen and to a lesser extent over the chest, presented a marked generalised pigmentation. Two deeper patches were present on the back, but they had been present before the illness. There was no pigmentation of the mouth nor any intense pigmentation of those parts subjected to slight irritation, such as the axillæ and waist. At no period was the pulse rapid, the blood pressure remained normal—about 120 maximum and 80 minimum—though on one occasion the maximum was 140. The heart was never found enlarged, and no murmurs were ever detected. The abdominal organs were also normal; neither liver nor spleen was enlarged during any occasion on which she was examined subsequent to 1926, and there was never anything abnormal in the urine. Menstruation had remained regular, though on occasions it was scanty and shorter than it had been.

On no occasion—except that to be referred to—was there any return to the hæmorrhagic condition from which she had previously suffered. "Bruises" were indeed occasionally noticed though, since she was an active person, a slight injury could not be excluded. Though for the most part she led an active existence in the country, and was able to walk and swim as well as other girls of her own age, she could not stand the burden of a post in London with light duties which she tried to take up. She never appeared fatigued, and was never unusually breathless when at home.

In March, 1930, her condition was more or less stationary; she was in good health, apart from the anæmia, and it was thought desirable to give up adrenalin in order to see whether she could do without it. After 12 days she had two slight nose-bleedings, and a third subsequently, much slighter, after the adrenalin was resumed. The opinion of her parents was that it was not wise to give up the adrenalin. She had not, however, felt unwell as a result of leaving it off.

She had occasional colds. In 1929 she suffered from an attack of diarrhœa and was two days in bed, and it was not generally thought that she had any specially lowered resistance to intercurrent febrile disease. In the last four days of April, 1931, however, she contracted chicken-pox from another person, and the rash, which was typical in distribution and character, on the third day became hæmorrhagic. There were sores round the mouth, extreme fœtor of the breath, with gangrene of the gums, and dysphagia set in 18 hours before death. Hæmorrhage occurred from the bowel, and there was some blood in the urine. She relapsed into a muttering delirium. Two gangrenous patches appeared on the back. Before this, however, there had been several attacks of excruciating pain in the back, requiring morphia. This pain was not located to any function, and its anatomical origin could not be determined. She died on the fourth day of the disease.

The condition of the blood had remained practically at the level that was reported before. In all, 25 blood counts were taken between September, 1926, and February, 1931. The average of these is as follows: red cells, 3,020,000; hæmoglobin, 64 per cent.; colour index, 1·6; white cells, 2700. Differential count: polymorphs, 27 per cent.; lymphocytes, 56·7 per cent. Taking the hæmoglobin as an indication of the anæmia, there was a tendency to fall as time went on. The average hæmoglobin of the year's counts is as follows: 1927, 69 per cent.; 1928, 59 per cent.; 1929, 66 per cent.; and 1930, 58 per cent. The last hæmoglobin percentage recorded was 56 per cent. The halometer reading (Eve), which is an indication of the size of the corpuscles, showed no significant variation from the normal. Microscopically there was usually some evidence of activity of the bone-marrow in the presence of anisocytosis and polychromasia. Now and then immature cells, such as neutrophil myelocytes and large lymphocytes, were present in the differential counts. Platelets were usually present, but in small numbers (not counted).

Numerous attempts have been made to ascertain the causation of the anæmia, both from the history and by giving drugs. Her residence in India, and indeed the diagnosis of malaria made in that country, appeared to suggest that disease as the initial cause. Treatment by quinine, however, has never made any difference that could be estimated, and there have been no attacks of fever such as could be attributed to that agent.

The conclusion appears to be that, through some unknown cause, the blood-forming organs had been partly destroyed, leaving the patient with sufficient for a modified existence when constantly stimulated by adrenalin, but that, without the adrenalin, the bone-marrow activity was insufficient to prevent the tendency to hæmorrhage. During the greater part of her life, since the adrenalin was started, there was no special lack of resistance to infections, but this lack of resistance was unmasked or induced by the attack of chicken-pox which brought back the hæmorrhagic tendency in its former violence.

TREATMENT OF HABITUAL ABORTIO WITH WHEAT-GERM OIL (VITAMIN E).

By P. Vogt-Möller, M.D.

(From the County and City Hospital, Odense, Denma

The existence of a fat-soluble antisterility vita —vitamin E—must now be considered establish Papers on this vitamin up to the year 1927 reviewed in Evans and Burr's monograph[1]; I woul however, mention here that the first informatio about such a vitamin is due to Evans and Bishop.[2]

Vitamin E is found in certain vegetable oils, chiefl in wheat-germ oil, but also in many other oils o vegetable origin. Sure,[3] for instance, found it in crude maize oil but not in the commercial product of maize oil; it is also to be found in plant leaves—e.g., of lettuce. Little or no vitamin E is found in animal substances; it is, for instance, not found in cod-liver oil.

As yet the importance of vitamin E to the organism has only been elucidated in detail for rats. Beard,[4] however, has proved that mice, too, need vitamin E. The sterility occurring when this vitamin is lacking in the food is of a different pathogenesis in the two sexes. In the male the vitamin seems to play a part in spermatogenesis, histological changes of the testes being found in avitaminosis E, especially a more or less marked degeneration or even complete disappearance of the spermatogonia. In the female, on food free from vitamin E, ovulation and implantation take place normally, the reproductive system being unimpaired, and the sterility being due to the fact that the implanted ova are resorbed at an early stage of the pregnancy. In male as well as in female animals vitamin E may be stored to a certain extent.

BRITISH MEDICAL ASSOCIATION.

ANNUAL MEETING IN EASTBOURNE.

PROCEEDINGS OF THE REPRESENTATIVE BODY.

THE annual Representative Meeting of the British Medical Association opened at the Town Hall, Eastbourne, on July 17th, with Dr. C. O. HAWTHORNE in the chair. Lord DAWSON OF PENN was elected President of the Association for 1932–33.

Antenatal Clinics.

Dr. B. H. PAIN, for Tunbridge Wells, moved that the Council should consider and report on the various antenatal schemes now being administered in different parts of the country without waiting until the Government maternity scheme was published. A year ago, he said, Dr. Brackenbury had stated that the Ministry of Health regarded the B.M.A. scheme for a national maternity service not unfavourably, but no Parliamentary Bill appeared to have been drafted embodying the principles of that scheme. In the meantime antenatal clinics in charge of whole-time medical officers were increasing throughout the country and patients were being examined by doctors who would never attend them in their confinements. To begin a maternity service on different lines from those laid down by the B.M.A. was to consolidate it on different lines. It was not the business of the local branches and divisions to oppose such developments in their own areas, but rather a matter for central opposition from the Council. In Kent, for example, the medical officer of health agreed with the policy laid down in the Association's scheme, but he had no influence with the 20 or 30 local authorities who were providing antenatal clinics with full-time medical officers.—Dr. H. B. BRACKENBURY (chairman of Council) said he was prepared to accept the motion of Tunbridge Wells, but he thought there were limits to the influence which could be exerted by the Council on local developments. It was not possible to insist that the proposals made to the Ministry of Health should be put into action. The Council could only rest in the assurance that the Ministry was actively in favour of a scheme following some of the lines laid down by the Representative Meeting. A circular had been issued to local authorities in which emphasis had been laid on the value of the general practitioner in local maternity schemes. The divisions and branches of the Association should see that this recommendation of the Ministry was carried out.

The meeting supported the proposal of Tunbridge Wells.

Medical Patents.

Dr. ARNOLD LYNDON (chairman of the Central Ethical Committee) introduced the question of patents. The proposal he brought forward was that the Association, while adhering to the traditional view that it is unethical for a medical practitioner who discovers or invents any substance, process, apparatus, or principle likely to be of therapeutic value, to act against the public interest by unduly restricting its use for his own personal advantage, should nevertheless recognise the propriety of utilising arrangements made by law for the protection of such inventions or discoveries and the reward of those who have made them, provided the principles enunciated above were duly safeguarded. Last year the question of dedicated patents had arisen and the whole subject, said Dr. Lyndon, had been referred back to the Council for further consideration, but in the last few months the Board of Trade Patents Committee had reported unfavourably on dedicated patents, so that these need no longer be regarded as coming in the realm of practical politics. Foreign countries at present held an advantage in that an English invention might be published and foreign competitors might patent it, thus keeping the inventor from using his own discovery. The value of the Patent Laws was to promote industrial activity. If after four years there was found to be abuse of a patent the controller could investigate the position and revise or withdraw that patent. Since the above motion was drafted, Dr. H. H. Dale had set out the point of view of workers in laboratories where medical research was carried on (*British Medical Journal*, June 27th, Supplement). Dr. Dale found that far from resenting the embargo on patents in medical research these workers regarded it as a charter of liberty and open dealing. He doubted, moreover, whether it was possible to give a fair definition of "unduly restricting" and he thought it would be far wiser to repeal all references to patents from the policy of the Association and to regard the subject as outside its province. Dr. Lyndon thought that some of the dangers foreseen by Dr. Dale would not occur. He pointed out that a patent could not be obtained without full disclosure of the details of the process or invention and, far from leading to secrecy, it brought any discovery that was made into the open.

Dr. J. S. MANSON spoke in support of Dr. Dale's letter. The meeting must consider whether Dr. Lyndon's motion opened the door to the commercialisation of medical invention and discovery. Patenting was permitted to medical men in other countries. He thought that considerable weight must be given to Dr. Dale's letter and he suggested that the subject might be referred for discussion by the Association Professionnelle Internationale des Médécins.—Dr. J. W. BONE and Dr. LYNDON thought that it was undesirable to go abroad for an opinion and that it was the business of the Representative Meeting to express their own view of the position.—Sir ROBERT BOLAM persuaded Dr. Manson to withdraw his suggestion and Dr. R. D. MOTHERSOLE introduced an amendment limiting the application of the motion to those engaged in scientific research. It was felt, however, that this amendment unduly restricted discussion and it was not accepted by the meeting. Sir ROBERT BOLAM then proposed another form of the motion to read as follows:—

> "That the Association approves the traditional professional usage in accordance with which it is unethical for any medical practitioner who discovers or invents any substance, process, apparatus, or principle likely to be of value in the treatment of patients to act against the public interest by unduly restricting, by patent or otherwise, the use and knowledge of such discovery or invention for his own personal advantage."

This, he said, would not interfere with the action of any person who thought he ought to take out a patent if he felt he could do so without disadvantage to the public. It also left the field clear for those who did not wish to take out patents.

Mr. H. S. SOUTTAR appealed to the meeting to adhere to the original motion. The present attitude of the Association placed the medical man in an invidious position and made him feel he was doing something wrong when he wished to take out a patent, whereas really he would probably be performing an act of value to his country and to national industry. Foreign countries were able, at present, to reap the reward of British inventions and discoveries. If the proper patents had been taken out at the time, we should have kept the aniline dye industry in this incident coincided with the commencement of a gradual decrease in the amount of saliva and with a feeling of "dryness in the nose." A year later she suffered from severe paroxysms of headache which lasted for three days, and were followed by a decrease of the lacrymal secretions. Eighteen months after the initial shock (Dec., 1926) there was a complete cessation of all normal secretions from the eye, nose, and mouth, but during that period and up to the time of examination, she had secreted thick sebaceous material from the Meibomian glands and mucus from the nose, while on rare occasions globules of mucus had appeared in the mouth.

The symptoms of which the patient complained and the associated pathological conditions of the three organs, eyes, nose, and mouth, were as follows:—

Eyes.—Vision and pupil reflexes normal. There is a complete absence of moisture on the eyeball and, however strong the emotion or local irritation, there is no lacrymal secretion. A constant accumulation of thick sebaceous material from the Meibomian glands covers the eyeballs and is most marked on waking or when the patient is worried or mentally agitated. The irritation which results from this secretion necessitates frequent efforts on the part of the patient to remove it. Collosol argentum has given some relief while other applications seem to aggravate the discomfort. Whether the Meibomian secretions are abnormally copious and tenacious or only seemingly so (due to the absence of secretions from the lacrymal and Krause's glands), it is difficult to determine. On eversion of the upper eyelid the inferior lacrymal gland is seen to be to some extent atrophied, but the outlines of the Meibomian glands are well marked. There is some occlusion of the puncta lacrymalia and I have had difficulty in passing a sound.

Nose.—The sense of smell is good. The patient is able to sneeze but no liquid secretion is exuded. Every morning there is a large accumulation of mucus which adheres to the back of the soft palate and has to be removed by a nasal douche before the patient can breathe or articulate in comfort. She finds vaseline, applied inside her nostrils, gives relief from the dryness.

The nasal mucous membrane is normal in appearance but without the normal moisture. The patient has not suffered from colds or nasal catarrh since the commencement of her complaint.

Mouth.—The sense of taste is normal. There is a complete absence of salivary and buccal liquid secretion. The mucous membrane of the cheek, palate, and gums is smooth, shiny, and dry. The teeth show a marked tendency to decay. There is slight chronic superficial glossitis. Mastication, deglutition, and articulation are difficult and nearly impossible unless the patient first moistens her mouth.

The plicæ sublingualis are somewhat atrophied. The orifices of both Stenson's and Wharton's ducts are much contracted, and it has been found impossible to detect the orifices of the left upper Stenson's duct even when using a magnifying glass; but a strand of silkworm gut has been passed through both Wharton's ducts and the right Stenson's duct. After massaging the submaxillary region, while the patient exerted suction at the same time, two or three globules of mucus were occasionally seen around the orifices of Wharton's ducts. Galvanism has been applied to the chorda tympani nerve but without effect. Salivation takes place after the injection of pilocarpine, and also occurred during an attack of acute toothache lasting for three hours in 1930.

Food.—The patient can take any food except that of an acid or astringent nature, and she states she has "the digestion of an ox." The absence of ptyalin has been compensated for by the development of a desire to take large ,a' 1ntities of sugar, and she swallows about 15 from the 'umps" of sugar daily.

urine. She of smell, taste, and sight are in no way gangrenous ps the digestion. The dryness and local this, however, e parts affected, particularly the eye, excruciating pai in masticating and talking, are the This pain was ncomplained of. The mucus and anatomical origin em to function normally; the died on the fourth daose secreting liquid secretion.

The condition of the n function is shown by the at the level that was rencarpine, and that the whole counts were taken between ct, if only as a result of 1931. The average of these is by her salivating as a hæmoglobin, 64 per cent; c result of pain and to a lesser degree by the effect of pilocarpine.

Her symptoms seem to result from some derangement or disharmony of her sympathetic (autonomic) system. The most likely explanation of the cause and of its consequent symptoms appear to me to be as follows:—

1. That there has been a desensitising of some part of her reflex arc, with the result that only strong stimuli effect reflex action.

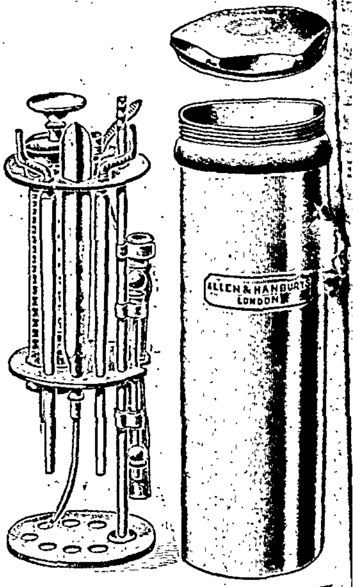
2. That the inhibition centres and perhaps the cortical connexions, either sympathetic or parasympathetic—it seems impossible to determine which—have become permanently excited by the residual effect of the initial shock.

The patient has unfortunately been unable to take complete rest or a holiday since the onset of the symptoms. Many drugs have been tried but none has been of any benefit. The treatment has resolved itself, during the last month, into repeated injections of pilocarpine, by which I hope to overcome the diminished sensitivity of the reflexes in question to normal stimuli; and there is no doubt that of late there has been more lacrymose secretion and that the nose is less dry.

NEW INVENTIONS

SPIRIT-PROOF CASE.

THE difficulty of sterilisation of the maxillary antrum puncture outfit and paracentesis knives before use has been met by the spirit-proof case here illustrated. The antral puncture outfit is the one designed by Mr. Cokeley, and all the instruments are of stainless steel.



Messrs. Allen & Hanburys, Ltd., Bethnal Green, London, E.C.2, are the makers.

ALFRED WALFORD,
F.R.C.S.

MANCHESTER HOSPITALS.—The foundation-stones were laid recently of the new Christie Cancer Hospital and the Holt Radium Institute at Withington. The cost, including the nurses' home, will be £150,000. The new hospital will have 104 beds instead of the present 33; last year there were 450 in-patients. The ceremony marked the physical union of two institutions which in separate buildings have for some years carried on work which has lately become so closely related that the boards of management have just been amalgamated under the chairmanship of Mr. Nathan.—Large additions to Ancoats Hospital have just begun. The new buildings will include a ward block four storeys high, having 15 beds on each floor, another block consisting of a massage department, a pathological department, and two theatres. Had sufficient money been forthcoming a further ward block with 60 beds and quarters for the additional nurses, together with more spacious domestic accommodation, would have been provided. As it is, the work now begun will cost £65,000, of which £45,000 is at present in hand.

police sent for the doctor in case of accident. He had found that out of 61 police forces in the country only 29 had agreed to this arrangement. The Medico-Political Committee had pointed out when the Road Traffic Act was before Parliament that the doctor should receive a fee as well as the hospital, but they had been told the doctor was in a position to sue for his fees while the hospital was not. He thought the best plan would be to take up the matter locally and to try to get the police forces to agree to pay a fee when they were responsible for calling a doctor. In other cases the local authority should be persuaded to pay a fee, if possible; in his district the local authority had agreed to pay the doctor's fee in all road accidents except those occurring to insured persons.

Dr. BONE admitted that he had acquired more constructive proposals from the discussion than he had anticipated. Dr. Fothergill had forgotten to point out that in Brighton an effective scheme was in force by which every policeman carried a voucher which is handed to the doctor; on presentation of this voucher the Brighton town council paid the fee. He believed there were similar schemes in operation in Willesden and Gateshead. The branches and divisions of the Association should try to induce their local authorities to adopt some plan of the kind.

Dr. Fothergill's proposal was adopted without contrary vote by the meeting.

Additional Benefits and Approved Societies.

Dr. DAIN (chairman of the Insurance Acts Committee) moved a resolution that the Association would deprecate medical practitioners taking service under any scheme for the provision of additional treatment benefits which would bring them directly or indirectly under the control of approved societies. This attitude with regard to the approved societies, he said, was one of the cardinal principles enunciated by the Association in 1911 and 1912. Additional treatment benefits had varied under the different insurance societies, depending on the surplus which each possessed, and had so far taken the form of a sum of money given to the patient for the necessary treatment; but it was not to the advantage of either the patient or the doctor that in any organised scheme for the provision of additional benefits the approved societies should have complete control.—In this view the meeting supported him with the alteration proposed by Hampstead, that "would deprecate" should be replaced by "disapproves of."

Two other motions introduced by Dr. DAIN were carried without discussion. The first related to additional treatment benefits 8 and 16, and proposed that services of a specialist or consultant nature should be given, so far as was consistent with the best interests of the patient, by a private practitioner at his consulting rooms, the patient's own home, or at clinics specially established for the purpose. The second provided that under additional benefit 10, where the patient was referred to hospital for treatment, the choice of hospital should lie with the doctor and patient, and not with the approved societies.

Choice and Change of Doctor.

Dr. DAIN said that the Association still objected to the new arrangements for change of doctor. At present the patient could only change his doctor once a quarter, and then only on giving a month's notice. This was against the principle of free choice, as well as being against the best interests of the patient. A number of difficulties were already arising; although the patient could, with the consent of both doctors, change at a moment's notice, he was usually loath to ask the practitioner with whom he was dissatisfied to sign the necessary paper, and as things stood he might be compelled to pay fees to the new doctor of his choice for three months before he could obtain a transfer. The patient was entitled to free treatment, and panel practitioners were prepared to give it, but this regulation could rule the patient out of the right to receive service for three months.

Dr. A. B. MURRAY (Banff, Moray and Nairn), introduced a resolution protesting against any interference with the liberty of the insured person to change his doctor when he so desired. The Association had always held the free choice of doctor to be a cardinal point in their policy. He mentioned a case in which the patient had wished to change his doctor one month before the quarter, but had been too late to give in his notice. As a result he had to pay fees for four months before he could change.—Dr. BRACKENBURY seconded the amendment. If the approved societies and the Ministry of Health were not going to support this cardinal principle the only remedy for the profession was to seek the weight of public opinion. The insured patient should be as far as possible in exactly the same position as the private patient. Approved societies in the interests of finance had curbed the freedom with which the insured person could change his doctor. It was a serious inroad on the rights of the patient. The opposition which the Association had always given to such limitation of freedom was in the interests, not of the doctor, but of the patient. The present system gave the doctor a vested right in the patient for a given period and this was wholly undesirable.—Dr. FOTHERGILL assured the meeting that in East Sussex and Brighton these draft regulations had been completely ignored. They had been promulgated in February but had never been confirmed.

Some opposition to the amendment was introduced by Dr. J. FORRESTER. He was somewhat embittered in the view he took of the case owing to an encounter with a patient who had changed his panel doctor five times in fourteen days.—He was supported by Dr. G. F. P. GIBBONS, who thought a sentimental attitude had been allowed to creep in with regard to the unfettered choice of doctor by the patient. In times of industrial depression patients were apt to "go sick" with undue frequency, and if they could not obtain certificates from their own practitioners they would go to less scrupulous doctors while they were in a position to transfer as frequently as they pleased.—Dr. D. F. TODD and Dr. R. D. MOTHERSOLE shared this view.—Dr. F. J. KERR thought that on this question the Association had an excellent opportunity to defy the Ministry in the interests of the patient.—Dr. E. STUNGO (Lambeth) put the position for free choice neatly. If the patient was genuinely dissatisfied he surely had a perfect right to change his doctor at once; if he was one of the disgruntled type who had no faith in any doctor, his practitioner would be only too glad to get rid of him.

Dr. DAIN considered that the present position *did not* actually abuse the principle of free choice; it had merely reduced considerably the opportunities for employing it. He did not think, however, that a crusade in which all insurance practitioners should go to the length of resigning in order to enforce the principle was appropriate or necessary at the present time.

Dr. Murray's resolution was carried.

Dividends and Gifts from Pharmacists.

Mr. F. C. Pybus, for Newcastle-on-Tyne, moved that the meeting was strongly opposed to the offer of any reward or dividend by chemists, as an inducement to an insured person to bring his prescriptions to be dispensed. In his district, he said, there was a tendency for insurance patients to have their prescriptions made up at the coöperative chemists rather than at the private chemists.—Dr. R. Boyd (Manchester) had also found that where the coöperative system was in operation the number of attendances at the surgery and the number of evening calls increased. The chemists had offered dividends to the patients in the form of cash, soap, and other commodities, to the detriment of both the drug fund and the general practitioner. It was not so long since medical attendance was given away with a pound of tea, and a time might yet come when patients would collect their panel prescriptions—50 for a gramophone, 100 for a wireless set.—Dr. Dain said that it was not legal for chemists to give bonuses, but that the position was the responsibility of the pharmacists and had nothing to do with the Association. The insurance committees were beginning to say that any bonuses which were given should belong to them.

The motion was carried without dissent.

Ophthalmic Service.

Mr. Bishop Harman said that it was within the knowledge of the Council that a few ophthalmic surgeons had been giving lectures to meetings of sight-testing opticians' organisations. The Association had always held the view that sight-testing by other than qualified medical practitioners was not in the best interests of the patient, and he therefore moved that a registered medical practitioner should not take part in the instruction or examination of opticians or student-opticians in clinical ophthalmology.—Dr. F. A. Roper thought the motion liable to misconstruction. Science was universal, and any refusal to disseminate knowledge should be preceded by an explanatory phrase. He suggested that the motion should state that, in view of the opinion of the Association that the practice of sight-testing by other than qualified medical practitioners was not in the best interests of the public, the Association considered that a registered medical practitioner should take no part in the instruction or examination of opticians or student-opticians in clinical ophthalmology.—This expression of opinion was supported by the meeting.

Mr. Bishop Harman gave a brief history of the National Ophthalmic Treatment Board scheme, which has now been running for two and a half years. Clinics, he said, were now held in a large number of towns in England and a few in Scotland and Wales. Those eligible for treatment were insured persons and their dependents and those families with an income of less than £250 per annum; a fee of 10*s.* 6*d.* was charged by the ophthalmic surgeon visited, and for this sum he gave all the advice possible at the first consultation. Although the scheme was still run at a loss there was every hope that it would be self-supporting next year.—Certain speakers, including Dr. Campbell Orr, spoke in favour of the scheme, but a motion was introduced by Dr. E. E. Brierley, for Cardiff, that the general practitioner should be allowed to send his patients directly to the ophthalmic surgeon and not, as at present arranged under the scheme, to a dispensing optician at the clinic.—In this he was heartily supported by Dr. Helen Lukis (Kingston-on-Thames). In her area, she said, the scheme had been a failure. The dispensing optician attended at the clinic for two hours twice a week. It was impossible for an insured patient to be sure of being able to attend at those times, and dangerous delay might further be introduced, in an acute case, by the difficulty of making a telephone appointment with the ophthalmic specialist.—Mr. Bishop Harman, in replying, expressed his sympathy with the Cardiff motion, but said that at present employment of a dispensing optician in the scheme was necessary; his duty was to save the ophthalmic surgeon all office work, and he was there solely as a clerk; he had no right to direct either the patient or the doctor in their choice of ophthalmologist.

On the suggestion of Dr. Brackenbury, the meeting passed to the next business, since it was felt that though a more direct service between the doctor and the ophthalmic surgeon was desirable it could not be achieved in the present early stages of the scheme.

Development of Public Health Services.

Dr. E. K. Le Fleming (Bournemouth) referred to the position of the public health services throughout the country under the Local Government Act of 1929. In many areas the local authorities had been unwilling to do more than take over the poor-law duties and administer them without alteration. He proposed that the Council might ascertain and report on three aspects of the progress shown by local authorities—namely, in arranging the unification of health services, the better coöperation between municipal and voluntary hospitals, and the position of the medical officer of health in relation to the local authority and its health services.—Dr. Brackenbury thought it would be useful to describe the present deadlock to the meeting from another angle. It was almost wholly owing to the representation of the Association that it had been recognised that the medical officer of health of an authority should also be the me[illegible] officer to the public assistance committee. It [illegible] been indicated by the Ministry of Health [illegible] what lines it was desirable for the local author[illegible] to extend their activities, but the Ministry would n[illegible] have to wait until schemes were submitted for sanction by these authorities before taking further steps. Until such schemes were submitted it was impossible to criticise existing arrangements. In addition the Ministry had appointed inspectors in some areas to report on the health services, and action, of course, could be taken based on those reports. But relatively few authorities had so far submitted schemes to the Ministry and consequently information on progress in the country as a whole was meagre.—Dr. R. M. F. Picken (Cardiff) said that most of the authorities who intended to submit schemes had done so already, and that many of them did not provide for satisfactory unification of health services. The longer the Association waited without taking action the more difficult it would become to get the position changed. It was true that the joint efforts of the Association and the Society of Medical Officers of Health had done something to standardise the relation of the medical officer of health to the public assistance committees. But his status was only that of medical adviser to the committee, and not medical officer. Consequently, administration of health services was not necessarily in the hands of the medical officer of health. The meeting supported Dr. Le Fleming.

Payment of Hospital Staffs.

A resolution was moved by Sir Richard Luce, on behalf of the Council, that where a voluntary hospital gave in-patient treatment to patients for whom the local authority accepted financial responsibility, the members of the visiting staff of the voluntary hospital should be remunerated. He suggested that the local authority should pay to the hospital the maintenance cost of each patient plus an addition of one-quarter for medical services, and that of the total sum received 20 per cent. should be allocated to the visiting medical staff.

Considerable discussion followed. Dr. H. H. MacWilliam doubted whether the Committee would be able to arrange for such a proposal to be carried out, and Sir Ewen MacLean thought that opposition would be more likely to come from the governing bodies of the voluntary hospitals than the local authorities. It would be useful to find out, he considered, what schemes of this kind were already in operation.—Dr. Peter Macdonald thought it was a pity to hesitate over a new policy by stopping to inquire what was in practice in other areas. This was a matter for the education of hospital authorities and there was no reason why it should not become acceptable throughout the country.—Dr. T. W. Wadsworth feared that to ask for 20 per cent. was to ask for too much, but Sir Robert Bolam thought this was a very reasonable sum. The working-man governor of a hospital would be willing to recognise that the labourer was worthy of his hire and, though he might bargain shrewdly, would be willing to pay something. The demand was a reasonable one and should be pressed for.—Dr. J. Livingstone Barrow-in-Furness) had had a different experience. He had found that hospital governors were ready to admit that the labourer was worthy of his hire, but that they had no intention of giving it.—Dr. T. D. Ewart described an anomalous case in which the Hospital Saturday Fund had to pay 10*s.* for admission of a patient to the voluntary hospital and 1 for his admission to the municipal hospital. The medical profession wished the patient to have free ice of hospital, and he thought that if a position reached in which the voluntary asked more than municipal hospital, the local authorities might refuse to send their patients to the voluntary hospital. He warned the meeting against over-emphasis of the financial aspect.—Dr. F. A. Roper, Dr. Middleton Martin (Gloucester), and Dr. F. Radcliffe (Oldham) thought it undesirable to go back on the motion, as it would weaken the position of the staff in hospitals where the principle of payment had already been accepted.—Sir Richard Luce said that where voluntary hospitals were being used as a convenience by municipal authorities there was no question but that they should pay a reasonable sum for their patients, and the meeting approved that view.

The Problem of the Out-patient.

An active discussion followed the proposal in the Report of the Hospitals Committee on the Problem of the Out-patient, that the types of cases in out-patient departments fall properly into three groups—viz., casualty cases, consultation cases, including those retained for special treatment, and discharged in-patients.

Sir Richard Luce, who moved the acceptance of the report, said that at present out-patient departments were wasteful, and growing in rapid excess of the growth of population. Discharged in-patients and chronic cases should be referred back to the doctor. It should be realised that an out-patient department was a place primarily intended to give emergency treatment and to provide consultation and specialist opinion, and it should not be used as a dispensary for chronic patients.

Sir Ernest Graham-Little doubted whether it was the proper time to bring this motion forward, since it could not possibly be realised, and he moved that the report should not be approved. He asked whether the Council had considered carefully the composition of out-patient departments before saying that certain patients should not attend. The National Health Insurance Act had made no more than a temporary difference to the attendance at out-patient departments and the inference was that a certain number of insured persons went to hospital. In Guy's Hospital report for last year it was stated that 40 per cent. of out-patients came as consultation cases; of the remainder a considerable proportion were the non-insurable dependents of insured persons, and a certain section consisted of the new poor of the middle classes. It must be remembered that in many cases three-quarters of the hospital expenses were defrayed by associations corresponding to the Hospital Saving Association. If the public gained the idea that an arrangement had been made by private practitioners by which the patient could be prevented from going to hospital without his doctor's permission there would be considerable objection. The hospitals belonged to the public and the private practitioner should not be allowed to choose what cases should attend them.

Mr. H. S. Soutar thought Sir Ernest Graham-Little had somehow acquired a false idea of the object of the report, and he was glad that the Association now had the opportunity of rectifying it. The out-patient department should be the main point of contact between the general practitioner and the hospital, and the whole object of the report was to encourage patients to go to hospital and to make the conditions of their reception more favourable. It made all the difference to a patient attending hospital if he could produce a doctor's letter recommending him for treatment. The body of general practitioners in this country wished the hospital out-patient departments to be the consultative service of the State. The intention was not to protect the general practitioner but to make the out-patient departments more effective and to give the best service to the patient.—He was supported by Mr. McAdam Eccles, who thought that the present overcrowding was easily preventible; the chronic ordinary type of case should be seen once, diagnosed, and sent back to the proper official for treatment. The veteran of 60 or 70 attendances should no longer appear at the out-patient department.

Dr. H. D. Woodroffe felt that patients as a whole were not out for something for nothing; where they could spare a fee for a consultant they were ready to pay it, and maintained their self-respect by making the effort. Out-patient departments should provide a consultative service for those who could not afford to pay for it.—Sir Robert Bolam also emphasised the folly of wasting the service of out-patient departments by allowing them to be overburdened with chronic cases. The day had gone when the length of the list of out-patients treated was regarded as an index of the value of a hospital.

Sir Ernest Graham-Little's proposal that the report should not be adopted was lost by a large majority.

(To be continued.)

Enlargement of Arbroath Infirmary.—Sir John Cargill has now formally opened new wings which have been added to this hospital. The extensions, which have cost £17,680, include a children's ward and the enlargement of the nurses' quarters. The children's wing contains ten beds and two private wards. An old block has been converted into private wards, rooms for the resident medical staff, and a lecture hall.

MEDICINE AND THE LAW.

Industrial Disease Compensation: a Delayed Claim.

IN a Workmen's Compensation Act appeal, lately dealt with by the House of Lords, Lord Blanesburgh remarked of a certifying surgeon that "so far as professional skill was concerned he adequately filled his post, but as the filler up of a form he had shown himself a blunderer." The comment was not intended harshly. Learned judges are aware that accuracy and success in the filling up of forms are not automatic; they themselves have occasionally revealed inability to complete a printed will form so as to make a valid testamentary disposition of their property. The case before the House of Lords, however, displayed an unusual sequence of errors. First of all, the certifying surgeon, having to certify an industrial disease case, filled up the certificate with the wrong disease—or rather he described the disease as "epithelioma of the scrotum" instead of using the exact description from the statutory list of industrial diseases. Secondly, when faced with the words in the form, "I hereby certify that the disablement commenced on the —— day," he neither filled in the blank nor crossed out the sentence (as the form required him to do if the blank were not filled). This omission left it uncertain whether he meant to specify a date or to let the date of the certificate stand (under Section 43 (2) of the 1925 Act) as the date of disablement. The Act treats the date of disablement from an industrial disease as if it were the happening of an accident for which the workman can recover compensation. Section 14 of the Act stipulates that the employer must have notice of the workman's claim within six months. Here the certificate (the basis of the claim for compensation for the industrial disease) was dated July 24th, 1929; but that date was more than 12 months later than the date on which the workman left the employers' service. He had been an operative cotton spinner; the employers had closed down their works entirely on June 13th, 1928, and the man had not been employed since then. The firm repudiated liability on the ground that the claim was out of date. Three months later the trade union agent, acting for the workman, applied for a fresh certificate. The certifying surgeon thereupon examined the man again and sent another certificate, but made yet another mistake in filling up the form. He correctly described the industrial disease, but the date of disablement was specified as "the 22nd day of 1929," no month being inserted. After further correspondence, the certificate came back complete at last; it was dated Jan. 18th, 1930, and it specified the date of disablement as "the 22nd day of May, 1929." The claim, having thus been made as on Jan. 18th, 1930, was out of time; but the Act contains a proviso (to Section 14) safeguarding cases where the failure to make a claim within the time-limit is found due to "mistake, absence from the United Kingdom, or other reasonable cause." Did the facts of the case amount to "reasonable cause" for the delay? The House of Lords has answered "Yes." So the workman, suffering from epitheliomatous cancer after 17 years as a cotton spinner, fortunately does not lose his statutory compensation by reason of the errors which contributed to the delay in making the claim. But it is to be understood that Parliament intended the time limit to be some protection to the employers against improper claims; and Lord Blanesburgh adds the warning that the recent decision is not to be taken to countenance the workman "sitting on in the knowledge that he has contracted a disease and doing nothing to make good his claim."

B.M.A. Action against Drug Stores.

In the Chancery Division, on July 15th, the British Medical Association obtained an injunction against a defendant, trading in South-East London, who offered for sale drugs and medical remedies bearing the letters "B.M.A.," and who called his business the "B.M.A. Drug Stores." The defendant argued that "B.M.A." did not necessarily or exclusively denote the British Medical Association, and that he was entitled to use the letters. Mr. Justice Maugham, however, was satisfied that the acts of the defendant tended to injure the Association as being likely to cause its existing members to leave it and its prospective members to abstain from joining it. The Association was a purely voluntary body, dependent o subscriptions. People who saw the words "B.M.A. Drug Stores," or the defendant's shop-windo might think—and ordinary members of the publ would think—that the British Medical Associati was somehow connected with the shops. The ca resembled the proceedings on July 13th before M Justice Farwell, wherein the British Legion co plained that a company called the British Leg Club (Street), Ltd., was conducting a club at Stre in Somerset, which owed no allegiance to the Brit Legion; the members of the club were to be e Service men or other persons over age; there was requirement that the members should be members the British Legion. The defendant company answe that it had been incorporated in 1921, whereas t British Legion was not incorporated as such by Ro Charter until 1925. The judge said the name "British Legion" was well known in 1922, and it w a fallacy to say that a voluntary association cou not assert its right to the name; there was clear possibility of confusion even if there was no act evidence. Both the British Legion and the Brit Medical Association succeeded in obtaining the injunction desired.

A HOSPITAL TRIBUTE.—Sir Henry Dickens Common Sergeant of the City of London, recently unveiled in the male ward of the Passmore Edwards Hospital, a bronze tablet in recognition of the work of the Dickens Players, of Bowes Park, who have substantially helped the hospital by their performances.

COMPULSORY VACCINATION.—Mr. Arthur Greenwood, the Minister of Health, on July 15th received a deputation of Members of Parliament who urged that compulsory vaccination should be abolished, and expressed a hope that the Government would introduce or give facilities for the necessary legislation. They believed that all they wanted could be achieved by a one-clause Bill. The Minister said that he was bound to administer the law as it stood. The effect of the Local Government Act had been to place the administration of the Vaccination Acts in the hands of the larger local authorities, and he did not contemplate any drastic amendment of the law until those authorities had had time to gain experience of the operation of the Acts in force and furnish him with their views and advice. He believed that complicated and highly controversial legislation would be necessary to secure what the deputation desired. He must, in present circumstances, prefer the claims of other legislation to those of a Vaccination Bill. While, therefore, he could have no objection to the introduction of a Private Member's Bill as a means of testing public opinion, he could give no assurances either of support for such a Bill or of the introduction at an early date of Government legislation.

REVIEWS AND NOTICES OF BOOKS

The Histopathology of Skin Diseases.

By LEO MCCARTHY, M.D., Associate Clinical Professor of Dermatology, Georgetown University Medical School, &c. London: Henry Kimpton. 1931. Pp. 513. With 250 illustrations, 54 in colour. £5 5s.

THIS magnificent volume represents the first serious attempt to produce an original text-book of cutaneous histology in the English language. It has been crowned with success, for the illustrations are superb, and the author has succeeded in compressing the rather diffuse descriptive material into its important essentials. The result is, however, much more than a catalogue. By incorporating a brief clinical description of each morbid condition, he has succeeded in enlisting the reader's interest in the detailed histology, and has given vitality to a subject which has always suffered from the reproach of dullness. The work contains chapters on the normal anatomy of the skin and its appendages, pigmentation, atrophies, hypertrophies, acute and chronic inflammations, tumours, the dermatomycoses, and blood diseases. A complete chapter—as is only fitting, for much of the original work was done in America—is devoted to the precancerous dermatoses. In his description of diseases in which the ætiology is obscure or controversial, Dr. McCarthy maintains a neutral attitude. This policy is well illustrated by the section on lupus erythematosus. The present position is ably summarised in a few lines: "Although no definite proofs have been advanced to prove the tuberculous origin of the disease, most investigators are agreed that it is in some way intimately connected with tuberculosis. At the present time nothing more definite can be said." Again, "it should be mentioned that the histological picture of L.E. does not reveal even the slightest similarity to that of tuberculosis of the skin. . . ." He is careful to avoid the temptation to enter into a dissertation on a question which has troubled the world of dermatology for a decade.

The difficulties of nomenclature in the group of parapsoriasis are dispelled by a neatly tabulated list of equivalents according to the French and German schools; the various synonyms which have greatly added to the confusion surrounding this group are also tabulated and will be found of much value. Mycosis fungoides is classified with the skin manifestations in diseases of the blood, such as myeloid and lymphatic leukæmia. Some beautiful microscopical illustrations amplify the description of this fatal disease, and make it easy to realise and remember the salient features of the three accepted stages. In the same chapter it is suggested that in many cases originally described under the name pityriasis rubra of Hebra the diagnosis was not confirmed by blood counts; such cases may indicate only a sign or symptom such as universal erythrodermia, and not a disease sui generis. Earlier writers may have included such various entities as mycosis fungoides, lymphatic erythrodermia, or tuberculosis in the same group. This work is likely to remain a standard text-book of the histopathology of the skin in the English language until the science of histology itself gives place to new methods of cutaneous investigation. Its appearance is an event in dermatological literature for which the specialist will be grateful.

Backache.

By JAMES MENNELL, M.D., Medical Officer, Physicotherapeutic Department, St. Thomas's Hospital. London: J. and A. Churchill. 1931. Pp. 190. 10s. 6d.

FEW symptoms are more baffling than backache, or, in spite of its common occurrence, more inadequately dealt with in ordinary surgical text-books. Dr. Mennell has written a very useful little book on the subject. He says in the preface that he was prompted to undertake this task because "of the injustice of the judgment formed, in the early period of my study of backache, that all patients grossly exaggerated their symptoms and that the symptoms themselves were, to a great extent, neurasthenic." The tendency to regard these sufferings lightly is still too prevalent, and it is this attitude that leads a patient to seek relief at the hands of unqualified practitioners, often without the knowledge and against the advice of his own doctor. When one reflects that the text-books used by those who qualified some 10–20 years ago devoted more attention to "railway spine" than to the strains of the sacro-iliac joints, little blame can be attached to the doctor for his failure to appreciate how much can be done to-day, by orthopædic methods, to relieve backache. Dr. Mennell has not attempted to compile a big thesis, embodying the views of other authors, but contents himself with a clear, simple, and short account, illustrated by admirable diagrams, of the results of his own wide experience. Throughout he keeps in view the needs of the general practitioner, and the book is so arranged that, except for one important omission noted below, information on any particular point can be found without reading through the whole book. This monograph should find a place in the libraries of all practitioners, for it is only by acquainting them, and through them the general public, with the aims and methods of the orthopædic surgeons and physicians that the glamour and mystery surrounding the practices of the unqualified bone-setter can be removed. The omission of a substantial section on backache associated with childbirth mars the book. Dr. Mennell mentions this aspect of the subject only patchily and rather by implication. The symptom is so tiresome and so common, both before and after labour, that the practitioner might reasonably expect to find a fuller discussion of it in a work of this kind. Not even under the headings of childbirth, labour, post-partum, pregnancy, or sacro-iliac joint is there any reference made to it in the index. This is the only serious fault we have to find, and one which can easily be made good in future editions.

Hay-Fever, Hay-Asthma.

Its Causes, Diagnosis, and Treatment. Third edition. By WILLIAM LLOYD, F.R.C.S., late Surgeon in Charge of the Nose, Ear, and Throat Department, Kensington General Hospital. London: Straker Brothers, Ltd. 1931. Pp. 124.

THE last edition of this book was published 23 years ago. The first chapter consists of a review of opinions on the exciting causes of hay-fever, but the more recent work on protein sensitisation is not discussed. The second chapter is on the predisposing causes, the third on the symptoms, and the fourth on the treatment of hay-fever. The treatment advised by Mr. Lloyd consists chiefly in the removal, if present, of intranasal abnormalities, the cauterisation of hypersensitive areas, and the application of astringent lotions. The author does not appear to believe in individual idiosyncrasy to animal exhalations, which is generally regarded as an important factor in many cases of asthma.

A Text-book of Surgery.

By JOHN HOMANS, M.D. London: Baillière, Tindall and Cox. 1931. Pp. 1195. 40*s*.

THIS book is really a series of lectures for undergraduate students. It is perhaps a little uneven, and its recommendations are not quite explicit enough. It is well to instil principles, but the student will want to know more, for example, that the mere fact that iodine should be administered before operation for exophthalmic goitre. He will want to know how to give the drug, and in what dosage. Dr. Homans writes with an easy style, and an attractive feature of his book is the return to line drawings for purposes of illustration. The pictures are well executed and much more expressive than many of the photographs it is now customary to provide in modern text-books. At the end of the book the names of all the authors who have been mentioned in the text are placed in alphabetical order with references to their original work.

Trial of Alfred Arthur Rouse.

Notable British Trials. Edited by HELENA NORMANTON, Barrister-at-Law. Edinburgh and London: Wm. Hodge and Co. 1931. Pp. 316. 10*s*. 6*d*.

THE trial of Rouse for the so-called "blazing car murder" had no conspicuous medico-legal interest. The Crown claimed to establish that the fire was not accidental and that the charred body could not have got into the position in which the victim died unless placed there while he was unconscious. On the former point the evidence of mechanical engineers was important; on the latter that of Sir Bernard Spilsbury. The presence of a single human hair on the mallet found 14 yards from the burnt car was not stressed. Rouse's own behaviour and statements (both before and during the trial) contributed largely to his conviction. Mrs. Helena Normanton, who edits the case in the Notable British Trials series, tells the story in a comprehensive introduction with dramatic gestures and moral reflections perhaps not inappropriate. In an Appendix she gives significant extracts from Rouse's medical records; he was wounded in the head at Givenchy. She also prints, and shows faith in, Rouse's confession as published in a newspaper on the day after his execution. One statement therein confirms a rumour current in the Temple at the time. "In my attaché case," he wrote, "was my identity disc, which the police have; I intended to put it on the man in the car so that people would think it was me; I forgot to do so." His wife's statement to the police, not yet released by the Home Office for publication, might be a crucial document. Rouse visited her before 7 A.M., a few hours after the car was burnt; later in the day the police took her to attempt identification of the remains. She was not called as a witness by her husband, nor did the judge comment on the omission.

One striking feature of the case was the total failure to identify the dead man; at first the body was thought to be that of a woman. In the preliminary proceedings before the magistrates, several women were called to speak of their relations with Rouse, and a police officer quoted his statement "my harem takes me to several places." Early and widely published, this evidence (subsequently excluded at the trial as irrelevant) alienated popular sympathy from the accused. His counsel could fairly complain that it prejudiced his chance of a fair trial. It seems odd, indeed, that magistrates, when investigating what is obviously a grave charge beyond their summary powers, cannot limit the inquiry to the minimum necessary for deciding whether or no there is a prima-facie case for committing the accused for trial. Perhaps by the fault of the prosecution or by that of the defence, magisterial proceedings are often far too long. It is, however, as Mr. Justice Avory observed on the appeal, difficult to say, when an accused person makes a statement derogatory to himself, whether it may not have some object connected with the defence. The Court of Criminal Appeal found no cause to disturb the result of the trial. Much comment on the case was published in the newspapers between trial and appeal. Is such publication contempt of court when there is no longer a jury to be influenced thereby? Lord Hewart's warning suggested that the answer might be in the affirmative.

The Physical and Radiological Examination of the Lungs.

Second edition. By JAMES CROCKET, M.D., D.P.H., F.R.C.P.E., Lecturer on Tuberculosis, Glasgow University; Visiting Physician, formerly Medical Superintendent, Consumption Sanatorium of Scotland, Bridge of Weir, &c. London: H. Lewis and Co., Ltd. 1931. Pp. 296. With illustrations, including 40 plates. 16*s*.

THIS book has been largely rewritten since t first edition appeared nine years ago, even the tit having been changed. For the student it is an excellent text-book, since stress is laid on the importance of giving due weight to the smallest detail of physical examination. A chapter deals with the measurements of the chest, vital capacity, and various tests of respiratory force; tables are given showing the average weight, measurement, and vital capacity of the normal individual. A very full chapter describes the X ray examination of the lungs. It is satisfactory to observe that adequate space has been devoted to the X ray appearances of the healthy lung, and the student is told what shadows may be regarded as normal. Bronchoscopic examination and the examination of the larynx is also described. At the end of the book is a glossary of terms used in connexion with the examination of the lungs. Some of these are helpful, but it is a pity that so many different signs, each bearing the name of its inventor, should be given. It is puzzling for the student to try to remember proper names, and he should not be worried with those which have no real value.

Several classifications of pulmonary tuberculosis are set out; the one used by the author is a modification of the Turban-Gerhardt classification, which shows not only the degree of systemic involvement, but also the presence of complications, such as laryngitis, and whether or not a large number of tubercle bacilli are present. The book is well-produced and illustrated.

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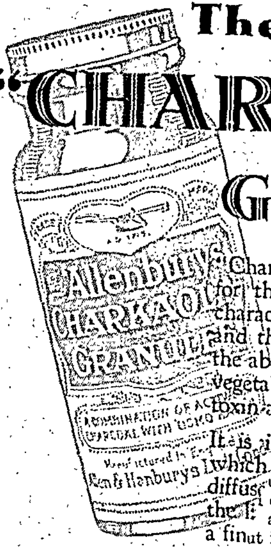

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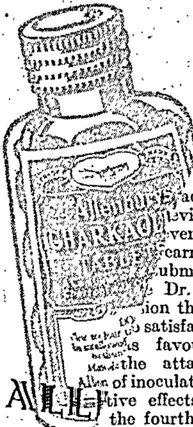
…actic vaccina- …erally regarded …ch has passed …out a stimulating … A. J. ORENSTEIN, …anitation, Central …hannesburg,[1] once … open to discussion. …ached the conclusion … evidence that inocula- …vention of pneumonia. …carried out by WRIGHT …ubmitted to statistical … Dr. G. D. MAYNARD, …ion that for a variety of … satisfactory evidence that …s favourably influenced; … the attack-rate, especially … of inoculation, was apparently …tive effects diminished until … the fourth month. He also …he apparent protection seemed …spiratory diseases other than … further experiments carried out were also unfavourably criticised …RD. In one, the 20,000 natives,

…riment included East Coast, …ical" natives, who were not …revious experiments; the other …he Premier Diamond Mine, which …gold mines in being an open pit. …periment, "Experiment No. 3," …y Sir SPENCER LISTER in 1914. …35,900 natives of various tribes, one- … were inoculated and the other half …ls. The inoculated natives gave a case- … per 1000 and the uninoculated 20·6 per …ch suggests that the treatment had a …alue. There has, however, been a gradual …in the death-rate from pneumonia among …ives on the Rand since 1920, when it was … 1000, to 4·34 per 1000 in 1930, and this … Dr. ORENSTEIN to institute another experi… in August, 1929. In three mines chosen as …g representative of the whole group under his …arge inoculation was discontinued, while it was …ntinued in the other mines of the group. The …verage native population in the uninoculated mines was 30,000, and in the inoculated ones 50,000. On comparing the figures for 1928 and 1930 it was found that in the inoculated group the attack-rate for 1930 was higher than for 1928, though the death-rate was lower, whereas in the uninoculated mines there was both a lower attack-rate and a lower death-rate. Mathematical examination of the actual figures indicates that inoculation is actually unfavourable to the reduction of the attack-rate from pneumonia. The advocates of inoculation have stated that the type of pneumonia on the Rand has changed, as observed clinically, from that prevailing in 1920. It is, perhaps, difficult to measure most clinical manifestations, but one, the fall of the temperature, can be accurately recorded, and it has been stated that in the modern cases the temperature tends to fall by lysis. Dr. ORENSTEIN claims that this is incorrect, and publishes tables showing that in 975 consecutive cases in 1912 crisis occurred in 34·7 per cent.; in 269 consecutive cases in 1929–30 the temperature fell by crisis in 75·4 per cent. From these and other data it is concluded that there has been no significant change in the clinical manifestations and time of attack of pneumonia during the period under review. Furthermore, post-mortem evidence lends no support to the view that there has been a radical change in the type of the disease. Finally, Dr. ORENSTEIN discusses the view that the inefficacy of the vaccine in current use is due to an alteration in the bacterial flora of pneumonia, and points out, even when the vaccine corresponded to the dominant flora found in pneumonia locally, no protection at all comparable in degree with that which follows antityphoid inoculation was ever demonstrated; and he also suggests that, on general grounds, protection is hardly to be expected against a disease an attack of which confers little or no immunity.

It is, of course, notoriously difficult to conduct crucial experiments where human beings are concerned, but it is not a little disquieting to find that the elaborate investigations which were



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…ylaxis in Pneumonia, Journal of the Medical …th Africa (B.M.A.), June 13th, 1931, p. 339.

carried out on the Rand are open to such stringent criticism. If experiments conducted with the assistance of a medical organisation as efficient as that on the Rand, and with many thousands of subjects, can be as inconclusive as these apparently were, what success can be expected from the application of the experimental method to other aspects of clinical medicine? For in few problems will the conditions be less complex or the point at issue more clearly defined. Dr. ORENSTEIN no doubt would claim that these experiments did, in fact, achieve a negative success, but it is doubtful if the exponents of prophylactic inoculation will agree with him; their reply will no doubt be forthcoming in due course, but, in the meantime, Dr. ORENSTEIN would seem to have established his thesis.

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THE MEDICAL OFFICER OF HEALTH: PAST, PRESENT, AND FUTURE.

QUIETLY, without disturbance of public administration, but also without any striking reform of procedure, the transfer of poor-law functions which was one of the main purposes of the Local Government Act, 1929, has taken place. Medical officers of health in counties and county boroughs are the responsible "advisers" of the public assistance committees, although their influence upon the deliberations of these committees inevitably varies in different areas. It may be presumed that local committees representative of the voluntary hospitals, in terms of Section 13 of the Act, have been set up, although outside of London and a few of the bigger provincial towns there is not much evidence that they have got down to business seriously. County councils are proceeding with the duty, imposed upon them by Section 46 of the Act, of rearranging the sanitary districts within their boundaries; and closely linked up with this problem is the very important obligation placed on them by Section 58 to ensure that every such district shall, when the opportunity of change arises, be served by a medical officer of health who is not engaged in private practice. It is fitting that this year, for the first time, the president of the British Medical Association is a full-time medical officer of health. Dr. WILLOUGHBY reveals in his presidential address, which we publish in abridged form on p. 171, a sympathetic perception of the reasons for the difference in outlook which sometimes impairs cordial relations between public health officers and practitioners. This difference should diminish now that medical officers of health have responsibilities in connexion with municipal hospitals, which must be largely curative, and, on the other hand, efforts are being made to enlist the coöperation of practitioners in the preventive work of clinics.

If the counties and county boroughs approach their tasks with a real appreciation of the objects underlying the Local Government Act, if local pride and the entrenchment of the old spirit of bumbledom in the new public assistance committees can be counteracted, we ought to be able to look forward to a new era of unification in the public medical services and of friendly coöperation between these and the various voluntary organisations whose fields of activity are being, if gradually, invaded. It is, perhaps, appropriate that the parting of the ways should be marked by the publication of historical accounts of the growth of public health organisation in places which have been in the van of sanitary progress since CHADWICK, CHESTERFIELD, SIMON, FARR, and other men of vision awakened the public conscience to the meaning of the hygienic disasters of a hundred years ago. In his book, "Health at the Gateway," Prof. E. W. HOPE[1] describes in popular language the development of the health department of Liverpool of which he was the head for many years. He deals chiefly with the special problems arising from the staple industry of that city—which is shipping—its peculiar exposure to the risks of infection from European transmigrants and the overcrowding and disease which arose from mass invasions from Ireland during the "hungry forties." The gradual evolution from a department consisting of a part-time medical officer of health working single-handed to the present large and complex organism is traced throughout the intervening years. The problems of Glasgow were not unlike those of Liverpool and an even more informative account of them and the way in which these were met was provided last year by Dr. A. K. CHALMERS,[2] who was formerly medical officer of health of that city. Dr. CHALMERS provides a fitting sequel to the classical writings of J. B. RUSSELL[3] which he brought together and edited in 1905. In these books the foundations [illegible] service are recounted and there is traced the slow synthesis of a health department by the attraction to it of one element after another, so that *it has* been gradually prepared for its latest and perhaps its greatest extension of functions, that which has come since these writers ceased to be active agents in the process. Looking back on the early days of preventive medicine in these cities we cannot fail to be impressed with the fact that their first medical officers of health were enthusiasts and missionaries. They were pressed to the service by a realisation that their day-to-day work as medical practitioners was nullified by conditions of living that must be rectified by large-scale operations. They were physicians by profession, propagandists by calling, and administrators by force of circumstances. Sir WILLIAM GAIRDNER was at one time professor of medicine and medical officer of health of Glasgow and perhaps it was this eminently desirable combination of appointments that gave to the health department of that city the scientific bent which has marked its subsequent activities. An even more striking instance of science wedded to administration may be found across the Atlantic in the life of the late HERMANN

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[1] Health at the Gateway. By E. W. Hope, O.B.E., M.D., D.Sc., Professor of Public Health, University of Liverpool. Cambridge University Press. 1931. Pp. 213. 15s.

[2] The Health of Glasgow, 1818–1925. By A. K. Chalmers, L.L.D., M.D. Printed by the Authority of the Corporation. 1930.

[3] Public Health Administration in Glasgow.

BIGGS of Yale, recently commemorated[4] by his friend and colleague Dr. WINSLOW. Among the many appointments which BIGGS held were those of bacteriologist, consulting physician to various hospitals, professor of anatomy, professor of materia medica, professor of therapeutics and clinical medicine, and professor of practice of medicine. He became successively director of the Rockefeller Institute and Commissioner of Health for New York City, general medical officer of its reorganised health service from 1902 to 1913, and, finally, Commissioner of Health for New York State. What more appropriate career can be imagined for a medical officer of health, but how is it possible to introduce such men to the head of affairs in an established service such as ours?

The public health service in this country has grown out of all recognition since its inception. Without losing its environmental interests it has come to embrace almost the whole range of clinical work. The men who have grown up in it during the last 30 years or more have been actively engaged in the treatment of certain diseases, some of which are almost side issues of medicine. To an increasing extent institutional organisation for the treatment of all sorts of disease is bound to be a dominating interest for the medical officer of the future, now that the functions of the poor-law have been transferred. If this integration of the medical services is to reach its full fruition in benefit to the communal health, it is imperative that these officers should be well and specially trained. The General Medical Council has shown its realisation of this need by issuing new regulations for the diploma of public health which, incidentally, are causing the medical schools some concern. But it is even more important that the method of selection of men for the senior posts of the service should be inquired into. There is none of their responsibilities to which lay councils cling more jealously than that of making appointments, and yet it is impossible to believe that they are fit for this task without expert guidance. The universities have met similar difficulties by the formation of appointments boards and this suggests a way which the Ministry of Health might point out to the councils, at least of counties and county boroughs. We fear, however, that the acceptance of any such proposal by local authorities would be long delayed. The Mayo librarian case in Ireland, where appointments have been centralised, shows the need for caution, but the successes of the Irish scheme have also their lessons for us. The fetish of administrative capacity has to be exorcised. Clearly it is desirable that medical officers of health should be capable of applying medical knowledge to the day-to-day routine of their office, but it is hard to see how sound administration can be based on any foundation but professional attainment and a close contact with the results of medical research. The medical officer of health, as BIGGS insisted, should be relieved as far as possible of petty office routine. Much less office discipline of medical staffs, for instance, would be necessary if appointments were always made on merit. The medical officer of health should be first of all a man of professional and academic attainment and in the second place an administrator. There is a danger that the present method of making appointments is tending in the opposite direction.

NUTRITIONAL ANÆMIA IN INFANCY.

FOR the past five years Dr. HELEN MACKAY has been investigating simple anæmia in infants. Some of her earlier conclusions regarding the prevalence of this condition and the means of preventing and treating it have already been published and are familiar to those who are interested in pædiatrics. Her more recent findings, however, emphasise the immense practical importance of this pathological condition, and the full account of her work, which has just been published,[1] is likely to prove of great service to those concerned in any way with the welfare of the infant. Her main thesis is that simple anæmia in infancy resulting from iron deficiency is extremely common and is directly or indirectly responsible for a great deal of ill-health among infants, because it is associated with a lowered resistance to infection. The statement has often been made that this type of anæmia is rare. By examining blood samples from healthy breast-fed infants and from infants in whom the existence of anæmia was ruled out as far as possible by appropriate prophylactic measures, it has been possible to draw a curve representing the normal hæmoglobin concentration during the first 12 months of life. Shortly after birth this concentration falls from its high level of 120–140 per cent. and reaches an average of 99 per cent. in the third or fourth week; by the second or third month it has fallen to 69 per cent., but then rises until at five or six months it reaches 80 per cent., where it remains until the end of the first year. The frequency of anæmia in the East End of London has been measured by the examination of more than 1000 infants. Only 10 per cent. of artificially fed infants and 16 per cent. of breast-fed infants showed a hæmoglobin concentration of 80 per cent. or more after the age of 5 months. The fact that appropriate treatment caused 69 per cent. of the infants to reach this hæmoglobin level is taken as evidence that lower levels of hæmoglobin concentration do, in fact, represent a true state of anæmia, and this conclusion is almost certainly justifiable.

That the main cause of this anæmia is a deficiency of iron, and possibly also of other metals such as copper, is suggested from the results both of animal experiments and of prophylactic trials in clinical practice. The production of nutritional anæmia in young animals by feeding them after weaning exclusively on milk has been recently reported from several laboratories, and it has been shown that this type of anæmia can be cured by the addition of iron together with traces of copper. The iron content of cow's milk is known to be lower than that of human milk, and is not, in fact, sufficient to supply the infant's needs after he has exhausted the reserves normally stored in his liver at birth. Dr. MACKAY has shown that the regular addition to a milk diet of a soluble iron preparation is remarkably successful in raising an infant's hæmoglobin concentration to the "normal" level. Iron and ammonium citrate was the preparation used, and it was either given in a mixture or was incorporated with the dried milk given to the infants in such proportions that from 4½ to 9 grains a day were taken. This preparation was shown to contain traces of copper, so that part of its effect may have been due to this metal. Although this simple or nutritional anæmia has been shown to be extremely common, at least in the East End of London, and to be readily amenable to treatment, it often appears to be associated with little or no general disturbance of health and might therefore be considered of no great practical importance. But evidence is presented in this report which shows that this view is untenable. Among Dr. MACKAY's cases the morbidity-rate of infants receiving prophylactic doses of iron was only about half that of control cases not receiving iron. Certain types of infection are known to predispose to anæmia, and this anæmia itself appears to reduce resistance to infection; the vicious circle can be broken by the administration of iron, and, in fact, many infants with chronic infections were observed who had an associated anæmia and who improved dramatically as soon as iron treatment was instituted. Moreover, the infants receiving iron gained in weight at a greater rate than the controls.

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[4] The Life of Hermann Biggs. By G. E. A. Winslow, D.P.H., Professor of Public Health, Yale School of Medicine. Philadelphia: Lea and Febiger. 1929. 15s.

[1] Nutritional Anæmia in Infancy, with Special Reference to Iron Deficiency. By Helen M. Mackay. Assisted by Lorel Goodfellow. With a Statistical Appendix by A. Bradford Hill. Medical Research Council Special Report Series, No. 157. London: H.M. Stationery Office. 1931. Pp. 125. 2s.

The evidence presented in this report, which has been subjected to statistical analysis by Mr. A. BRADFORD HILL, D.Sc., points conclusively to the existence and the importance of the condition of iron deficiency, or nutritional anæmia, among infants in this country. The simplicity of the treatment recommended for its prophylaxis or cure should ensure its wide adoption and the disappearance of a deficiency disease with its unfavourable effects on the health of the infant community.

ANNOTATIONS

NARCOTIC DRUGS: A NEW CONVENTION.

THE conference on the limitation of the manufacture of morphine, heroin, cocaine, and other narcotic drugs, to which reference was made in our issue of June 27th (p. 1407), was in session at Geneva from May 27th to July 13th. It has prepared another convention, which in some particulars is supplementary to the Opium Conventions of 1912 and 1925. As intimated in our annotation, the "quota scheme," whereby due proportions of the world's requirements of the drugs referred to were to be produced respectively by the eight countries which are at present engaged in their manufacture, did not commend itself to the conference. That scheme, espoused by the British delegate and backed by the advisory committee of the League, as well as by the London conference of manufacturing countries, found few supporters. The more complicated scheme, whereby annual estimates of the products of each manufacturing country are not to be exceeded, whether for export, conversion, government stocks, or home consumption, was adopted. Codeine, dionin, and peronin are to be brought within the convention, while heroin is only to be exported to governments. New preparations derived from opium or coca leaves are not to be manufactured unless the government of the country of origin is satisfied as to their medical or scientific value; nor shall such be exported until the opinion of the Health Committee of the League of Nations as to their capability of causing addiction has been declared. It is noteworthy that this new convention will not be applied unless and until 25 nations, including four of the eight manufacturing countries, shall have ratified it. The effectuation of an international treaty has to proceed by way of signature, ratification, putting the convention into force, legislation, and enforcement of legislation. The Geneva Convention of 1925 required ratification by ten Powers, including seven represented on the Central Board, of which two were to be permanent members of the Council of the League. It will be recalled that it was several years before that convention came into operation and that some of the more important opium- and coca-producing countries are still outside its scope. Statistics recently issued by the League of Nations show how much can be achieved by effective legislation based on the existing conventions, as in the case of the Dangerous Drugs Act, 1920–1925 of Great Britain. By such means it appears that the appalling illicit traffic in narcotic drugs can be successfully reduced, while their medical and legitimate uses are not unduly restricted.

THE CARE OF THE DEAF.

WE have on many occasions called attention to the neglect by the State of deaf persons who, if properly trained, could be made into useful and self-supporting citizens, and the matter has been constantly put before the public by the National Institute for the Deaf. Ministers of State, whose departments could do much to ameliorate the lot of these afflicted and handicapped persons, have expressed official sympathy under two administrations, while last year, at the annual meeting of the Institute, Mr. Baldwin gave an eloquent and thoughtful address on the subject. Apathy, however, has not been overcome, as was indicated by Lord Charnwood, the President at the annual meeting at Church House, Westminster, recently. He said that the average man and woman wholly failed to appreciate the character of the affliction, while, owing to lack of general knowledge, the necessary money for carrying out the beneficent work of relieving it was not forthcoming. Yet, he said, the sum needed was very small as compared with the response given to appeals for other charitable objects. The report of the executive committee of the Institute, which has reached us, emphasises Lord Charnwood's words. This shows that the debt on Richardson House, which now provides a home for a small group of deaf women, amounts to £1237, and that during the past year, apart from a legacy of £500, the ordinary current income has fallen slightly short of the expenditure. The legacy, which ought to have been used for endowment purposes, has been expended on current needs, and, as a matter of fact, a considerable part of the Institute's investments have had to be similarly treated. It is clear that there is as yet no general recognition of the fact that the burden of the deaf on the country might be turned into a valuable asset if the subjects of the disability received proper training.

MEDICAL EDUCATION IN RUSSIA.

The Russian government has to provide for a large primitive population spread over a vast area and is trying to create in a few years an effective medical service. The Chinese problem is in some ways similar, and it is interesting to hear comments on the Russian scheme from an experienced educationist in China. Dr. F. R. Dieuaide[1] chiefly criticises the establishment of medical schools cut off from association with universities. Such schools, he thinks, tend to run downhill, and their staffs must be constantly refreshed by drafting in men from intellectual centres. He fears for the new Russian system that a time will come when its graduates are equipped with out-of-date technique and can no longer satisfy the very needs that called them into existence. Technical schools of medicine will, he says, exist in any case, but it does not seem desirable to create them deliberately. Medicine is a living, growing field of human interest inextricably bound up with other sciences, and the physician needs not only the highest possible technique but all the intellectual power of which he is capable. In public health, for which Russian doctors are to be specially trained, this need is the greater by reason of the extended opportunities which this work offers. For this reason Dr. Dieuaide rejects the Russian solution of a large number of medical schools with low requirements and short courses.

ELECTRICAL APPARATUS AND ACCIDENTS.

During the last few months three serious casualties at hospitals have been reported in the press. In all of them the accident has been traced to some fault in the design, use, or condition of an electrical appliance. In one case an electric pencil light, used for examining the patient under an ether anæsthetic, caused a serious explosion, which was due to a spark resulting from a bad contact between the lamp and its holder. The second mishap was an explosion during an operation involving the use of diathermy apparatus. The third was attributed to faulty insulation in a radiant-heat apparatus, which resulted in a short circuit through the patient, and thence to the metal framework of the bed and the waterpipes. Two of these accidents were fatal and the other serious in its consequences. In two of them no harm would have been done but for the explosive nature of ether vapour when mixed with air, and they emphasise the warning that whenever ether is used the greatest care is necessary on the part of everyone concerned in the use of any appliance which is capable of raising the temperature of the air above the flash point. It is disturbing to think that there must be pencil lights, similar to that employed in one of the accidents cited, still in use. If the explosion was due to a bad contact between the lamp and the lampholder—and there is no reason to doubt the conclusion—this argues that the design leaves much to be desired. The avoidance of these accidents in future, then, is largely bound up with circumspection and with placing of faultless appliances in the hands of the practising medical public. Some few years ago, as part of a scientific instrument exhibition, an instructive section was devoted to those showing faulty design. It is a commonplace for anyone using electrical appliances to notice the rather casual way in which connexions are made between conducting wires and the plugs and switches to which they lead, and it is almost always at these points of contact that wires get frayed or break away from their bearings. It seems that ingenuity is still required to give flexibility in use and yet leave no weak spots.

Surgeons and other medical men have every year an addition to the electrical appliances put at their service, and there is an urgent need for guarantees of complete safety, such as we have had during the last few years in X ray work. In this department recommendations have been made which appear to give real safety where once there was real danger.

CARCINOGENESIS WITH DIBENZANTHRACENE.

The neat appropriation to cancer research of a method of preparing a complex chemical substance is described in the annual report of the British Empire Cancer Campaign, which is noticed on another page. If it were still necessary to emphasise the fact that pure research, conducted with no utilitarian bias, may find practical applications in the most unexpected quarters, this train of events would provide a cogent example. In February, 1929, a method for the synthesis of 1 : 2 : 5 : 6 dibenzanthracene was published in a German chemical journal having no connexion with cancer research. This is only one of a great number of new compounds constantly being produced by organic chemists, and there would have been nothing to draw attention to its possibilities as a carcinogenetic agent had not Mr. J. Hieger, working at the Cancer Hospital under the general direction of Prof. E. L. Kennaway, been on the look-out for new compounds closely related to benzanthracene. For he had previously noticed the resemblance between the fluorescence spectrum of benzanthracene and that of a cancer-producing coal tar, and the association had led him to seek a pure chemical substance which would replace coal tar as a carcinogenetic agent. Benzanthracene itself, which consists of four benzene rings fused together, has only feeble cancer-producing power; in a series of 70 mice painted with it, only one papilloma appeared. But the addition of one more benzene ring in a certain position (dibenzanthracene) has given 58 cancers and 9 papillomas in 190 mice, of which 104 lived for more than six months. Experiments are being undertaken with closely allied compounds, which vary greatly in carcinogenetic activity. The two compounds which, up to the present, have been found most active differ from the almost inactive parent substance, benzanthracene, in that the molecule, as shown in the conventional graphic formula, is extended at the lower left-hand corner, in one case by the *iso*propyl group $\begin{matrix}CH_3\\CH_3\end{matrix}\!\!>\!CH-$ in the other by a fifth benzene ring. The question whether this type of molecular structure has any general significance in cancer production must be decided by much further work. Many other compounds besides those mentioned above are being examined.

Dr. Cook has devised a method for preparing dibenzanthracene in a very pure state, and seems to have disposed of the possibility that the action of this compound is due to some unknown impurity. The usual method of producing tumours is to paint the skin with a saturated benzene solution of the compound in the strength of about 1 in 400; but a solution as dilute as 1 in 4000 has produced carcinomata after one year's painting. It is suggested, with good reason, that painting with crude tar should henceforward be considered obsolete for any purpose where the actual process of carcinogenesis is under study. All such experiments should now be carried out with pure substances. When one paints tar on the skin to produce cancer he is applying many scores, or even hundreds, of compounds, of which perhaps only one or two are actually required. All the superfluous substances may have their own confusing effects, and some of them, such as the phenols, are very irritating. Tar painting is suitable where the chief object in view is merely to obtain a number of tumours, but when the mechanism of their production is being studied the use of pure substances is obviously preferable. The examination of other chemical substances allied to benzanthracene continues, and it is anticipated that substances with far more powerful carcinogenetic properties will be discovered.

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[1] Nat. Med. Jour. of China, June, 1931, p. 283.

THE LABORATORY DIAGNOSIS OF MALARIA.

ELEMENTARY as they may seem, the laboratory methods which make malaria parasites readily visible give constant trouble to the isolated medical man in the tropics. This point has been impressed on Colonel R. Knowles, of the Calcutta School of Tropical Medicine, by the almost daily receipt of letters from all parts of India asking for help in difficulties of this kind. He has made this help generally available in a paper[1] in which he explains in precise and valuable detail how to prepare and examine thick and thin blood films and make Bass's cultures of suspected blood. For each procedure there is explained exactly what to do, what not to do, and how best to retrieve mistakes if, haply, correction is possible; and occasion is taken to point out how dependent is diagnostic success on payment of the most painstaking attention to detail, a warning which is equally needed in some other branches of tropical medicine. For all these matters the paper itself will be extensively consulted, and in this way the author's valuable experience will reach a wide circle.

But it is appropriate to state here certain difficulties which the personal factor introduces into the recognition of malaria parasites. At the end of a six months' course the 45 members of a class studying for the Calcutta Diploma in Tropical Medicine were given two tests of their skill in recognising the different species of malaria parasites. In the first the microscopical field contained a single parasite, and only 41 per cent. correctly named it; in the second, in which the slide might be moved and examined at leisure, 80 per cent. gave accurate answers. It is concluded that the latter figure displays the accuracy of a brigade or divisional laboratory. These same tests were then voluntarily submitted to by nine experts. In the first test there was agreement to the extent of 63 per cent.; in the second to 93 per cent. These tests, it is pointed out, show that the custom prevalent in certain laboratories of announcing the species of malaria parasite concerned, when only one or two specimens have been seen, will be wrong as often as not, and they make it clear that in this matter there should be some accepted standard of time spent in examining a specimen. It is suggested that this should be ten minutes, of which eight should be spent over a thin film and two over a thick one. It is felt that this is as much time as most laboratory workers can be induced or can afford to spend on a single case. In every instance it is held that a Bass's culture should also be made. Were the adoption of such a standard generally contemplated the demand would certainly arise for information as to the percentage of accuracy, in both the fact and kind of infection, which it actually attains in cases in which plasmodia are only scantily present in cutaneous blood.

STAPHYLOCOCCAL INFECTION OF THE NOSE AND LIP.

THE region of the nose and upper lip, drained by the anterior facial vein, has aptly been called the "danger area," with regard to staphylococcal infection. During the last two years attention has been directed, by a number of articles reporting fatal complications, to the serious consequences which may follow such infections. There is obviously some peculiarity about staphylococcal infections, apart from their close connexion with the cavernous sinus and the meninges, which render them dangerous and often fatal when occurring at this site. A carbuncle of the neck is a common affection, but when it occurs in a young and healthy adult the results are very rarely fatal. The thick skin and the presence of a dense subcutaneous tissue help in the production of a natural barrier to the infection, and when the subcutaneous veins are involved they thrombose and collapse, and thus assist in shutting off the infection. Dr. Irwin I. Koslin points out[1] clearly that the response to infection in the so-called danger area is different. The thin skin and subcutaneous tissue allow early and easy invasion of the veins, which are themselves different in structure; they are valveless and are "patent veins," which do not collapse when thrombosis occurs. They have, moreover, a very free connexion with the cavernous sinus through the ophthalmic and angular veins. There is no definite evidence as to the means by which infection spreads from the primary focus to the cerebral sinus, though it must do so in one of three ways—by the lymphatics, by direct spread of thrombosis, or by a retrograde embolus.

The point of practical interest is how to deal with a small primary focus on the nose so that the dreaded spread to the cavernous sinus may be prevented. At the beginning of the century treatment on ordinary surgical lines was advocated, and incision and drainage was generally accepted, just as excision of a carbuncle of the neck is widely practised now. The results of such excision are excellent, but the results of surgical intervention when the focus is on the nose were extremely bad. It is generally accepted that incision, squeezing, ligature of the angular vein, and other active measures are dangerous in that they may break down the delicate barrier being erected between the body and an invader that will rapidly kill once the defences are broken through. It seems desirable, however, that conservative methods, such as hot bathing, fomentations, saturated magnesium sulphate dressings, poultices, and even ultra-violet light treatments should be supplemented at the right moment by puncture and cauterisation. In an article on cavernous sinus thrombosis as a fatal complication of minor facial sepsis[2] Mr. Scott Brown suggests that at the first definite sign of pointing, it is safe and wise to puncture a small focus with a sharpened orange stick which has been dipped in carbolic; larger or "blind boils" he treats with liquor hydrargyri nitratis acidus applied to the core, precautions being taken to avoid overflow of the acid on to the skin. It is important to emphasise the serious results that may follow these minor infections, but those who are fighting them and vividly anticipating the development of an orbital cellulitis, chemosis, or proptosis, should remember that, though septic foci on the nose, lip, and particularly the naso-labial fold, are common, Dr. Koslin collected only six fatal cases from the records of the Lebanon Hospital between 1922 and 1930, and Mr. Scott Brown only the same number from St. Bartholomew's Hospital over a similar period.

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[1] Indian Med. Gaz., May, 1931.

[1] Annals of Surgery, July, 1931, p. 7.

EVOLUTIONARY TENDENCIES IN TEETH AND JAWS.

IN man the growth of a larger brain, and the cultivation of its complicated functions, call for much more time than is required for the development of other creatures, and during the years thus occupied the eruption of the teeth is delayed. In his lecture to the International Orthodontic Congress in London on Monday Prof. Elliot Smith pointed out that most of the problems responsible for the creation of the orthodontic profession arise out of the circumstances created by these delays in the growth of the jaw while the brain is growing. If æsthetic considerations and man's interest in faces play some part in creating the demand for orthodontics, the growth of the brain is chiefly responsible for disturbing the orderly process of uniform growth of the jaws from which the dental troubles arise. The chin, which is modern man's peculiar distinction, has probably developed because the growth of the tooth-bearing part is restrained by the long delay in the eruption of his teeth. There has been much speculation as to why this should be so, and it is strange, said Prof. Elliot Smith, that no mention has been made of the fact—clearly emphasised by Dr. H. A. Harris[3]—that the human child until the seventh year, during the pause in his dental development, is growing a phenomenally large brain, and for another 15 years or so, while again he is relatively sluggish in his dental affairs, he is occupied in learning how to put his complicated cerebral instrument to the biological uses essential for human existence. The delay in tooth and jaw development is undoubtedly due to these momentous events, and the salient chin is an index of "mental" development in the psychological as well as the anatomical sense of that term.

This wider vision of the evolution of the face, continued the lecturer, enables us to view in truer perspective many false claims that are repeatedly being made about human tendencies. The reduction in size or absence of the third molar is often said to be a sign that man is destined to lose that tooth in the near future. But in Peking Man, who is supposed by some palæontologists to have lived as much as a million years ago, the third molar is smaller than the others, and the same condition is not uncommon in apes and monkeys. It is in fact a tendency which the whole order of Primates has inherited. Nor, in Prof. Elliot Smith's opinion, does there seem to be any justification for the belief that dental troubles, such as crowding and displacement of teeth and the consequential difficulties, are due to evolutionary changes that are now active. There is no evidence that, apart from the results of racial mixture, any detectable changes are taking place in the jaws and teeth. The same irregularities and deficiencies were occurring 50 centuries ago and contrasts in the form and proportions of the jaws were just as marked. Evolution works with exceeding slowness, and there appears to be no certain evidence, he said, that any effects that can be attributed to recent evolution have yet been detected in modern man's jaws and teeth.

MEASUREMENTS FOR JAEGER'S TEST TYPES.

VISUAL acuity is universally measured by the size of type visible at a distance where accommodation does not come into use. The capacity to read at a short distance depends, apart from visual acuity, on the power of accommodation, and, in the case of myopes, on the degree of magnification which may be present owing to the short focal distance of the unaccommodated eye. For purposes of comparison it is desirable to have a standard of test type for near vision as universally recognised as that of Snellen for distant vision. The editions of Jaeger's type in general use are not quite uniform, although the smallest type is practically always of the same size (0·75 mm. for the height of capital letters and two-thirds of this height for other letters). A pamphlet published by the United States Public Health Service[1] proposes to standardise the size of Jaeger type, beginning at No. 1, as above, and going on with even increases of size by a geometrical gradient to No. 20, with the height of capitals fixed at 25 mm. A uniform standard is obviously desirable, and we think that the proposal of the United States Health Service should be adopted.

THE EPIDEMIOLOGY OF TRACHOMA.

BEFORE Noguchi died in 1927 he was working at a theory attributing trachoma to an organism which he called "bacterium granulosis," and his pupils claim to have confirmed his results. In a general review of the epidemiology of the disease, Mr. A. F. MacCallan[2] opines that until this organism has been isolated in Egypt, the home of the infection, judgment must be suspended. The various countries he divides into four groups, according to the prevalence of the disease. It is practically universal in Egypt, the Levant, Morocco, Algeria and Tunisia, Palestine, Arabia, Persia, and Iraq. It is very common in Italy, Greece, Corsica, Sardinia, Poland, Lithuania, Latvia, Esthonia, Finland, Czechoslovakia, Russia, China, Indo-China, Japan, Argentina, Mexico, and Turkey. It is occasional, with local heavy infections, in Ireland, Holland, Belgium, France, Spain, Portugal, Hungary, Austria, Germany (very local East Prussia), Albania, Jugo-Slavia, Bulgaria, Rumania, Australia (very local), and United States of America (very local, especially among the Indians). It is rare in England, Scotland, Wales, Norway, Sweden, Denmark, New Zealand, and Canada. Four stages of the infection may conveniently be recognised according to the prominence of lymphoid follicles, papillary hypertrophy, and connective tissue formation. Infectivity depends partly on the stage of the disease, the first two stages before cicatrisation has commenced being the most contagious, partly on the presence of an intercurrent acute conjunctivitis, and partly on the state of the conjunctiva of the recipient. No race of mankind appears to be wholly immune. The usual method of propagation is digital, with assistance from infected towels, handkerchiefs, and beds. Infections by flies probably play a part, though this is not proved. It appears that children are much more susceptible to infection than adults. The state of health of the individual appears to have no important connexion with the spread of infection. The increase of the number of infections during the hot months is probably only indirectly connected with the temperature, but directly with the occurrence of epidemics of contagious conjunctivitis due to the Koch-Weeks bacillus or the gonococcus, which in Egypt is not necessarily of venereal origin. In a typical Egyptian village it was found that a quarter of the children were infected with trachoma before the end of the first year of life.

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[2] THE LANCET, 1931, i., 960.
[3] Ibid., 691.

[1] Reprint from U.S. Public Health Rep., 1931, xlvi., 518. U.S. Government Printing Offices, Washington. 1931. 5 cents.
[2] Brit. Jour. Ophthalmol., July, 1931.

In the presence of dirt, bad housing, and bad water-supply, prophylaxis is almost impossible, but with the opposite conditions much may be done. For Europeans in the East the chief danger of infection is through native servants. In cases already infected, daily treatment by a skilled hand can do much to secure cicatrisation of the trachomatous conjunctiva. The history of the successful fight against trachoma in England is instructive. In 1874, Nettleship found 42 per cent. of the inmates of poor-law schools in London trachomatous. Since the establishment of a special school at Swanley, where all trachoma cases can be treated and educated at the same time, the percentage has rapidly decreased. In 1896 it was 4·9 per cent. At present all infected cases found in any of the L.C.C. primary schools are sent to Swanley. Last year the total number of new trachoma cases was 42. Among the general population in England it is now rare to see a case of trachoma, and when such are seen it is generally in those returned from the East.

SULPHUR TREATMENT OF G.P.I.

THE use of sulphur injections in general paralysis was originally suggested by D. F. Tutunji[1] in 1925, but Knud Schroeder, two years later, was the first to put it into practice. Since Schroeder described his early results in THE LANCET[2] a considerable number of English observers have recorded their experience in these columns. N. G. Harris[3] found that injections of sulphur in olive oil produce high fever, even in patients who have had malarial treatment previously. He regarded the method as safe, simple, and worth trial. W. H. Shilvock[4] was also favourably impressed, but remarked on individual variations in the responses obtained. He thought that the remedy probably acts by causing a focal reaction in areas of chronic sepsis. W. G. Patterson and S. R. L. Switzer[5] did not get such high temperatures as Schroeder with the doses he recommended; indeed, their average was between 101° F.–102° F. J. H. R. Laptain,[6] though pleased with the clinical results, found similar difficulty in obtaining high fever; and this observation is made again in a report from France by C. Levaditi and co-workers.[7] They have treated three cases, and say that the injections were well tolerated and sometimes evoked pyrexias similar to those of induced malaria. This action, however, is described as inconstant, and in none of the patients was any improvement noticed, either clinical or serological. They agree with Shilvock that the reaction varies considerably in different patients. Their first patient attained a temperature of 104° F. on two occasions early in the course; the other two did not reach this figure, which Patterson and Switzer regard as desirable. Yet with all this the mechanism of the remedy remains in doubt, and we welcome the publication of what appears to be the first experimental study of this aspect. R. P. Mackay,[8] of Chicago, after work on animals as well as human patients, tentatively attributes the fever to liberation of protein from muscle tissues which have been damaged by injection of the sulphur or by the irritant hydrogen sulphide. The building up of an immunity to sulphur strongly suggests, he maintains, that the reaction is biological rather than chemical, and he notes that patients in whom it is easy to produce fever by injection of typhoid vaccines also respond well to sulphur, and the contrary. Injection of sulphur suspensions into rabbits produced localised necrosis of muscle and an acute inflammatory reaction; and the facts, as he sees them, seem to place the fever following injections of sulphur on the same basis as that following extensive deep X ray therapy or extensive trauma to living tissue. Though it is too soon to decide on the therapeutic value of the remedy, one may say, Mackay concludes, that "sulphur can accomplish what fever produced by any other method can accomplish, and that by virtue of the long duration of the fever produced sulphur should bring results more rapidly and surely than any other method." At the same time the treatment should not be undertaken lightly, nor in cases where the therapeutic outlook is unpromising.

AVERTIN AND CEREBRO-SPINAL FLUID.

SOME observations on the effect of avertin on th[illegible] pressure of the cerebro-spinal fluid have been ma[illegible] at the Cleveland Clinic Hospital,[9] where this [illegible] has been in routine use for the surgery of neurological patients. The investigators found that, using the dosage of 0·1 g. per kg. of body-weight, there, was an increase in the pressure of the spinal fluid, of about 100 mm. of water, accompanying the narcotic state induced by the avertin injection. After about 15 to 25 minutes the pressure of the spinal fluid was about 50 mm. above the initial reading. It is conceivable that these results may be of practical import to those who combine the use of avertin injection with spinal analgesia. This combination has not, we believe, been very largely employed, but it is extolled by some as warmly as it is condemned by others. The future will, no doubt, assign to it its true value.

INDEX TO "THE LANCET,"

VOL. I., 1931.

THE Index and Title-page to Vol. I., 1931, which was completed with the issue of June 27th, is now in preparation. A copy will be sent gratis to subscribers on receipt of a post-card addressed to the Manager of THE LANCET, 7, Adam-street, Adelphi, W.C.2. Subscribers who have not already indicated their desire to receive Indexes regularly as published should do so now.

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[1] THE LANCET, 1925, ii., 408.
[2] Ibid., 1929, ii., 1081.
[3] Ibid., 1930, i., 1068.
[4] Ibid., 1930, ii., 347.
[5] Ibid., 1930, ii., 348.
[6] Ibid., 1931, i., 635.
[7] Bull. Soc. méd. hôp. de Paris, June 29th, p. 1134.
[8] Arch. Neurol. and Psych., July, 1931, p. 102.
[9] Jour. Amer. Med. Assoc., June 20th, p. 2102.

SPECIAL ARTICLES

AN INVESTIGATION INTO MATERNAL MORTALITY AND MORBIDITY

IN THE DOMICILIARY SERVICES OF MATERNITY HOSPITALS.*

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A consideration of domiciliary obstetric practice furnishes us with some very important information regarding maternal mortality. The domiciliary services of the large maternity hospitals and maternity units of the general hospitals, the services of such institutions as the Queen Victoria Jubilee Institute, and the records of cases attended by midwives in private practice, published by the local authorities, supply a mass of figures upon which exact calculations can be made. The services undertaken by these agencies differ very slightly as regards the conditions under which the work is carried on. Probably the services of maternity institutions, placed as they are in densely populated industrial areas, deal with the very poorest class, but all minister to individuals in very humble circumstances. On this point only a word or two is necessary. As far as can be judged from the investigations made by individual observers, public health authorities and specially appointed committees, all evidence goes to indicate that environment per se is not a causative factor of any consequence. "Crowded dwellings and dirty surroundings not in themselves increase the incidence of puerperal sepsis." † Similar statements are made regarding food and alcohol. As regards food, we are convinced from cases admitted to hospital that insufficient food and food deficient in certain ingredients or constituents do exert an unfavourable influence on the course of pregnancy and on recovery after labour. Such factors must be predisposing causes to sepsis and obstetric shock, however difficult it may be to estimate their extent.

Our investigations have impressed us with the fact that antenatal care and early recognition of abnormalities are the most important factors in obviating mortality and morbidity.

The Inquiry.

With the object of discovering what exactly are the results in the domiciliary practice of a large institution, we have taken the figures of the outdoor service of the Glasgow Royal Maternity and Women's Hospital for the years 1926–1930, inclusive. To make the analysis of these figures as complete as possible, we have made the following investigations: (1) the fatalities in the district practice of the hospital; (2) the fatalities in the cases transferred from the district to the hospital; (3) the fatalities in cases transferred to municipal fever hospitals, to which all cases of definite puerperal fever are sent; (4) the incidence of notifiable pyrexia in the district practice; (5) the incidence of pyrexia in cases transferred from the district into hospital; and (6) the incidence of death and of pyrexia in cases attended by midwives and by medical students in training.

Before discussing these figures we must explain certain features of the indoor and district services of the hospital. The Glasgow Royal Maternity and Women's Hospital has never discriminated between "booked" and "emergency" cases. Its service has always been at the disposal of all women in pregnancy and labour. Unfortunately, of the district cases attended during the five years under review, only about 27 per cent. have attended our antenatal clinic. In recent years not only has the accommodation of the hospital (at present 175 beds, inclusive of 23 in isolation block) been taxed to the utmost, but there has been a steady increase in the number of indoor abnormal cases. This is evident from Table I.

Table I.—*Percentage Abnormalities in Indoor and Outdoor Services of the Hospital.*

Year.	Indoor.		Outdoor.	
	Total cases.	Percentage abnormal cases.	Total cases.	Percentage abnormal cases.
1926 ..	3653	58·3	3594	16·6
1927 ..	3902	60·1	3538	19·4
1928 ..	3941	62·4	3797	17·6
1929 ..	3841	68·9	3820	7·5
1930 ..	4469	70·1	4079	8·9

As indicating the extent of the indoor operative work, we find that during the years under review there were 659 Cæsarean sections, 419 cases of placenta prævia, and 546 cases of accidental hæmorrhage.

As regards the district practice, there has been a steady fall in the number of cases operated upon outside, although the total number of cases attended has increased. This is clearly indicated in Table I. It is accounted for by the fact that in recent years operations of any gravity have been discouraged; only the simpler abnormalities are treated in the patients' homes. As far as possible we transfer to the hospital all cases in which any difficulty in the delivery is obvious or anticipated.

The organisation and technique employed has not varied. The patients have all been attended by medical students or nurses in training. If any abnormal condition is detected, or should delay in the labour occur, the outdoor house surgeon is summoned. He, in turn, can appeal to one of the members of the indoor staff. For the cleansing of the attendant's hands and of the patient's vulva, soap and water and lysol have been employed. We have now substituted for lysol the routine use of biniodide of mercury. The nurses wear aprons, but neither masks nor gloves. The students wear gloves.

Table II. indicates the relative incidence of sepsis in students' and nurses' cases in the outdoor department. It will be noticed that cases of puerperal sepsis have been subdivided into pyrexia and fever for the year 1930 only, the reason being that this year was the first complete one for which exact figures for pyrexia and fever separately could be obtained from the local health authority. The increased recorded incidence of sepsis during the years 1929 and 1930 is probably due to the introduction of new notification regulations, and the consequent more complete and accurate notifications.

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* Based on the district practice of the Glasgow Royal Maternity and Women's Hospital from 1926–1930, inclusive.

† Interim report of Departmental Committee on Maternal Mortality and Morbidity, par. 77, London, 1930.

Throughout this investigation we have used as the standard of morbidity that of the Department of Health (Scotland)—namely, the occurrence within 21 days after childbirth or miscarriage of a febrile condition in which a temperature of 100·4° or more has been sustained during a period of 24 hours or has recurred during that period. We have referred to the fact that students wear gloves and the nurses do not wear gloves. To this, and to the fact that the former are possibly more imbued with the "antiseptic spirit" or conscience, we attribute the lower incidence of sepsis in cases attended by students. The very low incidence of deaths and sepsis in students' cases compares favourably with the very best figures yet published—e.g., East End Maternity Hospital, London, where morbidity for district cases in 1928, 1929, and 1930 averaged 0·34 per cent. In this institution only "booked" cases are attended. The nurses wear no gloves, and they trust entirely to very thorough disinfection with perchloride of mercury. We are of opinion that the use of gloves is advisable as an additional protection to the patient, and that it is a protection to the attendant. The cost of gloves per patient, indoor and outdoor, works out at approximately 2*d*. per patient treated.

TABLE II.

Year.	Total cases.	Cases of puerperal sepsis.	Percentage incidence of sepsis.	Total deaths from sepsis.	Percentage incidence of deaths.
1926.					
Nurses .	2613	38	1·45	7	0·26
Students .	981	9	0·92	2	0·20
1927.					
Nurses .	2660	28	1·05	5	0·18
Students .	878	3	0·34	1	0·11
1928.					
Nurses .	3251	29	0·89	6	0·18
Students .	546	2	0·36	0	—
1929.					
Nurses .	3211	41	1·27	5	0·15
Students .	609	6	0·98	0	—
1930.					
Nurses .	3414	Pyrexia 20 Fever 42	1·81	1 6	0·20
Students .	665	Pyrexia 4 Fever 7	1·65	0 0	— —

TABLE III.—*Puerperal Sepsis in Cases Delivered on District.*

Year.	IN "NORMALS."			IN "ABNORMALS."		
	Total cases.	Cases of sepsis.	Percentage morbidity-rate.	Total cases.	Cases of sepsis.	Percentage morbidity-rate.
1926 ..	2,998	39	1·3	596	8	1·3
1927 ..	2,852	25	0·8	686	6	0·8
1928 ..	3,129	23	0·7	668	8	1·2
1929 ..	3,534	38	1·0	286	9	3·1
1930 ..	3,716	41	1·1	363	8	2·2
—	16,229	166	1·0	2599	39	1·5

Tables III. and IV. indicate the total deaths and cases of pyrexia which occurred on the district. Of the 15 non-septic cases, 1 died undelivered, 3 died partially delivered, 5 of "obstetric shock," 2 of pneumonia present during labour, 1 under anæsthesia, 1 after removal of adherent placenta, 1 after forceps delivery, and 1 from cardiac failure on the tenth day of the puerperium. The following are very brief particulars of the most interesting cases.

(1) Twins: no interference; collapse several hours later: obstetric shock. (2) Normal; no interference except placenta expressed; some hours later found dead; obstetric shock. (3) Found dead when first seen, baby being born to shoulders; labour said to have been precipitate and painless; ? acute cardiac failure or obstetric shock. (4) Breech; as doctor tried to deliver head patient died, before delivery. (5) Baby born spontaneously before nurse arrived; patient died same day, no apparent cause. (6) Patient died as doctor arrived; ante-partum hæmorrhage: undelivered.

TABLE IV.—*Total Maternal Deaths from all Causes in Cases Delivered on District.*

Year.	Total cases.	DEATHS IN CASES DELIVERED ON DISTRICT.				
		Cases of sepsis.		Non-sepsis.	Total.	Maternal mortality-rate from all causes (per 1000 cases).
		In "normals."	In "abnormals."			
1926	3,594	7	2	1	10	2·7
1927	3,538	6	0	3	9	2·5
1928	3,797	6	0	4	10	2·6
1929	3,820	3	2	2	7	1·8
1930	4,079	3	4	5	12	2·9
—	18,828	25	8	15	48	2·5

We must now add the cases transferred to the hospital from the district and treated in the hospital. These are shown in the next Tables (V. and VI.). Table VI. includes both categories tabulated in Tables IV. and V.

TABLE V.—*Deaths in Cases Transferred to Hospital.*

Year.	Cases.	Total deaths.	Deaths per 1000 cases.
1926	166	9	54·2
1927	143	6	41·9
1928	109	5	45·8
1929	133	6	45·1
1930	141	6	42·5
Totals ..	692	32	46·2

TABLE VI.—*Total Maternal Deaths in District Cases, including those Transferred to Hospital.*

Year.	Total cases.	Total deaths.	Maternal mortality-rate per 1000 cases.	Maternal mortality-rate in Scotland per 1000 cases.
1926 ..	3,760	19	5·0	6·4
1927 ..	3,681	15	4·0	6·4
1928 ..	3,906	15	3·8	7·0
1929 ..	3,953	13	3·3	6·9
1930 ..	4,220	18	4·2	6·9
Totals	19,520	80	4·09	6·7

(Maternal mortality-rate statistics for Scotland, according to the Department of Health, are not strictly comparable with those for other countries, owing to different methods of classification.)

We must now analyse the cases operated upon on the district (Table VII.).

Unfortunately, as regards Table VII. we have not been able to extract exact figures as to the number of occasions on which each of these operations were performed, but we have been impressed with the high proportion of cases which developed pyrexia when the placenta was removed manually. It is a striking fact that the only death from sepsis followed this operation.

We must now consider the incidence of death and pyrexia in cases transferred to the hospital from the district. The total district cases were 19,520, of which 692 were transferred to hospital. It is therefore with these 692 cases we have now to deal. Table VIII. is a summary of these cases.

TABLE VII.—*Details of Operations Performed on the District and followed by Sepsis.*

Year.	Total No. of operations.	Sepsis following operations.	Nature of operation.			
			Manual removal of placenta.	Forceps.	Curettage.	Suturing.
1926	454	4	3	1	—	—
1927	521	3	2	1	—	—
1928	501	6	6	—	—	—
1929	446	6	2	3	1	—
1930	208	5	3	1	—	1

TABLE VIII.

—	Deaths (32).		Pyrexia (68).
	Sepsis.	Non-sepsis.	Total cases.
Obstetrical complications..	6	5	38
Toxæmias	—	6	4
Ante-partum hæmorrhage:			
Placenta prævia ..	1	2	11
Accidental hæmorrhage	—	7	1
Post-partum hæmorrhage..	—	—	4
Abortion (and mole) ..	2	2	8
Cardiac	—	1	1
Debility	—	—	1
Totals	9	23	68

(The pyrexia-rate in these cases is 9·8 per cent.)

When a further analysis of these cases is made, we find they divide themselves into three groups: (*a*) Cases which died undelivered; (*b*) cases in which spontaneous delivery occurred; (*c*) cases in which operative treatment was necessary.

(*a*) CASES WHICH DIED UNDELIVERED.

There are six cases in this category. These patients only lived a few hours, some only a few minutes, after admission. Death in four cases resulted from accidental hæmorrhage, in one case from spontaneous rupture of uterus, and in one case from cardiac disease.

The high death- and pyrexia-rate shown in Table IX., 3·4 per cent. and 6 per cent. respectively, in spite of the fact that the delivery was spontaneous, is very striking.

It will be observed that in 9 of the 11 fatal cases death was due to eclampsia, accidental hæmorrhage, or yellow atrophy, and that 6 of the 19 cases of pyrexia were associated with those complications. This emphasises the importance of toxæmias as a cause of death and pyrexia.

Table X. shows a 4·06 per cent. mortality-rate and a 13·2 per cent. morbidity-rate in operative cases transferred from the district. This unselected operative group, illustrative of cases requiring institutional treatment, represents the grave cases one might expect to encounter in ordinary domiciliary practice. But had all these cases received close antenatal care, mortality and morbidity would have been enormously reduced.

We have, with the assistance of Miss Duff, our almoner, traced the total district cases which received antenatal care during these years, and, as already stated, found that they numbered only 27 per cent. of those attended. In analysing the deaths, we have been able to get exact information only regarding those district patients who were admitted to hospital and died there—32 in number. Of these only 5, or 15·6 per cent., had attended the antenatal clinic in the later weeks of their pregnancy.

It is of interest at this point to compare the mortality incidence in indoor cases which had antenatal supervision with those which had not. The death-rate over four years in the former category averaged 1·2 per cent. of admissions, as compared with 3·6 per cent. in the latter category.

Reports from Elsewhere.

In order to make our investigation of "district" midwifery a wider one, we have studied the 1926–1930 reports of several of the larger maternity hospitals and obstetric units of general hospitals in Britain,

TABLE IX.

(*b*) SPONTANEOUS DELIVERIES.

Cause for transfer to hospital.	Total cases.	Deaths, total.	Pyrexia, total.
Vertex, pelvis normal ..	121	1	4
,, ,, contracted	31	—	—
Face, delivered as such ..	2	—	—
,, corrected (1 brow, 1 face)	2	—	—
Breech	6	1	1
Complicated by—			
Albuminuria	9	—	—
Pre-eclampsia	5	—	—
Eclampsia	16	5	4
Pyelitis	3	—	—
Hyperemesis	1	—	—
Yellow atrophy ..	1	1	—
Cardiac	3	—	1
Bronchitis	3	—	—
Lobar pneumonia ..	1	—	1
Debility	1	—	1
Placenta prævia	14	—	1
Membranes ruptured ..	2	—	—
Pack	7	—	1
Accidental hæmorrhage ..	55	3	2
Membranes ruptured ..	6	—	—
Pack	1	—	—
Post-partum hæmorrhage..	5	—	1
Prolapse of cord	4	—	—
Replaced..	10	—	2
Hydramnios	2	—	—
Extensive perineal tear ..	6	—	—
Totals	317	11	19

TABLE X.

(*c*) OPERATIVE DELIVERY.

—	Total cases.	Deaths, total.	Pyrexia, total.
Breech delivery:			
Uncomplicated ..	40	—	4
With accidental hæmorrhage	1	—	—
Forceps: High	18	2	6
,, Low	82	—	9
Version:			
Transverse	15	—	2
Prolapse of cord ..	2	—	1
Placenta prævia ..	13	2	7
Pack and version:			
Placenta prævia ..	4	1	—
Accidental hæmorrhage	2	—	—
Cæsarean section	21	2	5
Craniotomy	17	1	2
Decapitation	1	1	1
Manual removal of placenta	17	1	3
Hysterectomy	2	1	1
Abortion: Spontaneous ..	11	1	—
,, Curettage ..	114	2	6
Hydatid. mole	6	1	2
Totals	369	15	49

(Abortions have been included in this table.)

and we are particularly indebted to the obstetric registrars of Queen Charlotte's, Guy's, St. Mary's (Manchester), and Liverpool maternity hospitals for their courtesy and assistance. Unfortunately, from none of the hospitals have we been able to extract figures exactly comparable over the five-year period.

As regards Queen Charlotte's Hospital, the total district cases attended for the years 1926–1930 numbered 8138, with four deaths and 321 cases of morbidity (3·9 per cent.). As the standard of morbidity used in these cases was "a temperature of 100° in the first ten days," a standard other than that of the Department of Health (which we employed), it is inappropriate to compare our figures. In that hospital district work is not done by students but by nurses and, until this year, neither gloves nor masks were worn by them. Lysol is the antiseptic employed.

In Guy's Hospital, the cases delivered on the district are not indexed separately from those delivered in the institution (from the hospital area), and consequently mortality- and morbidity-rates are composite for both categories. A temperature of 100·4 F. or more, sustained during a period of 24 hours or recurring during that period, has been used as the standard in calculating morbidity. In 1928, the morbidity-rate was 4·6 per cent.; in 1929, 4·1 per cent., and in 1930, 3·7 per cent. In Guy's service the wearing of gloves is optional, but is usual with students. The antiseptic employed is perchloride of mercury.

In the district service of St. Mary's Hospital, Manchester, gloves are only worn for instrumental deliveries, and the antiseptic used is biniodide or perchloride of mercury. During the earlier part of 1926, lysol was employed, and it is interesting to note that the puerperal sepsis-rate during that year was considerably higher than in subsequent ones. During the years 1926–1930, 6496 district cases were attended, with 6 deaths and 18 cases of puerperal sepsis. The B.M.A. standard of morbidity has here been employed, and this, together with the fact that district cases transferred to hospital are classed with hospital cases, has rendered a comparative analysis of their results with ours impossible.

The total number of district cases attended by Liverpool Maternity Hospital during the years of survey amounted to 7615. Figures of maternal mortality and morbidity for each of these years are not given in their reports, and there are no special statistics dealing with outdoor cases transferred to the hospital; consequently we cannot compare their results with ours. During the years 1928, 1929, and 1930, the district maternal mortality was nil. Both students and nurses wear gloves, and the antiseptic used is perchloride of mercury.

Conclusions.

We have investigated nearly 20,000 consecutive cases in the district practice of a large maternity hospital, including a "follow-up" of all the cases of puerperal sepsis. Impressed with the analysis of the figures we have reached certain conclusions.

(1) We consider the low figures for pyrexia in the outdoor work satisfactory.

(2) We are gratified to find that the results of the work carried on by medical students and midwives in training stand favourable comparison with those of the domiciliary midwifery services of other institutions and nursing organisations.

(3) It is our opinion that district morbidity can be further reduced, and that the routine use of gloves by pupil midwives and students, and the employment of biniodide of mercury, will assist materially in achieving this. We also advocate the wearing of a mask.

(4) We have been impressed by the fact that, in spite of the unfavourable conditions of district hospital practice, a simple antiseptic ritual appears to be sufficient.

(5) While not wishing to minimise the importance of sepsis as the primary cause of puerperal deaths, we would emphasise the important rôle of non-septic factors as causes of maternal mortality. The 15 deaths on the district from non-septic causes are illustrative of this; some represent probably the non-preventable accidental fatalities of childbirth. A number are stated, however, to have died of "obstetric shock" or collapse; this grave problem is receiving considerable attention at the present time.

(6) Our figures indicate that the morbidity-rate of the district service is lower than that of the indoor service in normal cases. One must, however, in making such a comparison, take into consideration the fact that the recording of temperatures is more complete in hospital than on the district. It would appear, therefore, that, judged from the purely medical point of view, there is no necessity for the general hospitalisation of uncomplicated cases. On the contrary, there appears to be a certain danger in housing normal with complicated cases. There can be little doubt, however, of the importance of transferring to an institution all cases requiring operative treatment.

(7) In common with others who have undertaken investigations into maternal fatalities, we are impressed with the high death-rate in women who had received no adequate antenatal care. As far as we can judge, the most striking immediate improvement in puerperal mortality and morbidity would be effected by the extension of antenatal care. It is most disappointing to find that the proportion of women seeking antenatal attention is so low (27 per cent.); further, that in the years under review it has remained stationary—viz., 1926, 29 per cent.; 1927, 25 per cent.; 1928, 25 per cent.; 1929, 27 per cent.; 1930, 28 per cent. It is to this aspect of the question that attention should be concentrated, in order to secure immediate improvement in maternal mortality and morbidity.

We desire to thank the Public Health Department of the city of Glasgow for their valuable assistance.

IMPERIAL SOCIAL HYGIENE CONGRESS.

AT a medical session on July 14th, at which Dr. DAVID LEES took the chair, a discussion on the

Choice of Remedies in Syphilis

was opened by Colonel L. W. HARRISON. In early syphilis, he said, his goal was 100 per cent. eradication of infection in every case. Other things being equal, he preferred the original 606 because it hit the spirochæte harder and longer than did 914, but unfortunately its reactions deterred many patients. Whichever arsenical drug was most convenient could be used, with a change to a different drug for the second course if the results had not been good at first. He believed in giving large doses and reducing the toxic effects to a minimum, rather than risking inadequate results for fear of consequences. The greater the individual dose, the better the immediate result. Encephalitis could be avoided by commencing the dosage cautiously and testing the patient's tolerance. Dermatitis would give no trouble if earnest attention were paid to the least sign of skin lesion and sodium thiosulphate were used promptly. A deposit of arsenobenzol in the skin often caused sensitisation, with increased liability to dermatitis at a later date; therefore care should be taken to enter the vein and if, by any chance, the needle missed the vein, another vein should be selected at once. Jaundice was a more troublesome complication, for it was tantalising and followed no rules. It was never seen in the female and seemed to occur in outbreaks. There was some evidence that it was related to fasting; it was very rare among private patients, who usually ate a good deal of fat. Recent experiments by Craven suggested that it was wrong to make the patient eat a great deal of carbohydrate, and that the seasonal variation was related to a reduction of fat at certain seasons.

The choice of a bismuth preparation was far from easy, and depended on whether the bismuth was to play the principal part in treatment or only to serve to keep up a concentration between courses of other drugs. For the first purpose the preparation must be absorbed quickly and in sufficient amount to give an adequate concentration in the tissues. Too small a concentration might have a provocative effect, but the amount to be dealt with in one day must not throw too much work on the kidney—i.e., it should not be more than 10 mg. For this reason small doses should be given two or three times a week. If the bismuth were to be only an adjuvant the preparation should be absorbed slowly, but the compound must give up its bismuth ion. Intramuscular injection had a higher therapeutic index and margin of safety than intravenous; the latter route presented the drug so suddenly that toxic effects were likely to supervene. Watery preparations were the most rapidly absorbed; they were said to be more painful than others, but this defect could be obviated by administering them with a local anæsthetic. They must be given two or three times weekly. Oily preparations were absorbed evenly and regularly but more slowly, and therefore made a less violent assault on the excretory mechanism. They were actively spirochæticidal, but must be given twice weekly. The insoluble preparations of choice were the oxychloride in watery medium (which the speaker preferred), the finely divided metal, and the salicylate; the fineness of the subdivision was undoubtedly a factor in the therapeutic power. These preparations were used when the patient's tissues were to remain saturated between two courses of another drug. The fear was that absorption would be too slow.

Mercury should only be used where bismuth was impracticable, for as a rule it was impossible to obtain the necessary concentration in the tissues without going over the edge of toxicity. For oral use he preferred the yellow iodide or calomel, the absorption of which was proportional to the dose. Metallic mercury should not be used. The oral route should, however, only be followed when circumstances prevented other methods. For injection a watery solution given intravenously daily or on alternate days was the best, but there was no point in giving it if bismuth was available. On the whole calomel was the best preparation for regular absorption and activity, but it caused some pain, which could be overcome by local anæsthesia. When it could not be tolerated a cream of not more than 10 per cent. concentration should be used. The site of injection should be thoroughly massaged. For such patients as migrants, for whom bismuth treatment was impossible, mercury by the mouth was useful; the perchloride or iodide should be used rather than grey powder and a concentrated ointment given for inunction.

Late syphilis presented a very different problem: that only of keeping the spirochætes in check. In this stage mercury might be valuable, because it prevented the reaction of the tissues—in late syphilis the patient was often killed by his own defences. If the cerebro-spinal fluid gave a positive reaction there was little hope of changing it after two years. Early pyrogenetic treatment should be given, combined with tryparsamide. Malarial centres should be organised for these patients.

DISCUSSION.

Dr. A. R. Cook said that in Uganda there was some doubt of the efficacy of 606, and referred to Dr. J. H. Sequeira's papers.[1] Extraordinarily few cases of tabes and general paralysis were seen in natives of Uganda, although syphilitic hemiplegia was relatively common and there had been a decided increase of cardiovascular syphilis. Mercury and bismuth were given concurrently with arsenical preparations. The Bagandi had been a slowly dying race, though head and shoulder above other natives in physique; an intensive propaganda against venereal disease, and an antenatal and child welfare campaign had therefore been started to counteract the decrease in population. Mercuric chloride by the mouth had been selected as a cheap, popular large-scale method and had attained an enormous vogue, with striking results among the pregnant women. Babies were born healthy, and congenital syphilis was much less common than it had been.

Dr. James McIntyre said that insoluble preparations had been found most satisfactory in County Durham. A lowered standard of nutrition had resulted in an increase of jaundice during arsenical treatment; dosage had been reduced and bismuth partially substituted.

Lieut.-Col. E. T. Burke said that a great deal of under-treatment was going on in this country. He thought intravenous administration of bismuth absolutely contra-indicated. Thorough treatment by mercury might have tragic results on the patient; the drug should not be used when bismuth and arsenic were available and its value was that of an adjunct only. A pyrogenetic centre had been established in Salford to put up a "malaria barrier between the clinic and the mental hospital."

Lieut.-Col. J. J. Harper Nelson described cases of arsenical neuritis seen in Lahore as a consequence of misuse of modern preparations. He had only seen two cases of tabes and one case of general paralysis in 12 years. Two of these three patients had had European blood. Possibly natives had been immunised by previous malaria. The commonest form of nerve syphilis was syringomyelitis, and the commonest circulatory lesion was aortitis.

Dr. Nora Wattie urged the hospitalisation of acute cases, with frequent small doses at the beginning of treatment. Complications seemed to occur in the later courses rather than the first.

Dr. A. O. Ross remarked on the great number of patients with primary syphilis who showed electrocardiographic change although they had no clinical signs of cardiac syphilis. He had seen a great deal of neurosyphilis in Europeans who had had malaria.

Dr. Myrtle Noronha suggested that lack of treatment in the early stage might account for absence of neurosyphilis in natives, the virus having burnt itself out before the "neuro" stage arrived.

Dr. Louise Pearse agreed that this might be so, and mentioned experimental evidence in support.

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[1] THE LANCET, 1930, i., 159, 723, and 1328; 1931, i., 57.

She agreed that 606 was a more effective therapeutic agent than 914.

Dr. A. G. **Coia** emphasised the rarity of tabes and general paralysis in the tropics and said that in British Guiana the treatment had been very unsatisfactory in the past; patients had probably died of other syphilitic complications before they had had time to develop neurosyphilis.

Dr. **David Lees** described cases of sensitisation to arsenobenzol preparations among the nursing staff. Attempts to desensitise had caused acute anaphylactic reactions and in one case death, although there had been no question of the presence of these substances in the tissues. He also referred to the production of aplastic anæmia by these drugs. He did not think that arsenobenzol was the sole cause of jaundice. Alcohol during treatment was certain to produce some type of intolerance. He relied chiefly on the arsenic to stamp out the spirochæte, the bismuth being accessory. There were few cases of intolerance so long as the hygiene of the mouth was attended to, and there should be a dental clinic associated with every venereal disease centre. He did not agree with the doubts expressed by Dr. Sequeira about 606. Malaria was undoubtedly the best pyrexial agent at present available, but it was time to seek for some other method. Pyrotherapy alone, however, was in most cases only alleviating; it must be supplemented by arsenic and preferably by tryparsamide.

Colonel **Harrison**, in reply, said that not a scrap of evidence had been found to indicate that modern treatment encouraged neurosyphilis. The incidence might be a question of soil rather than of seed. The average European stopped his malaria with quinine and therefore might develop neurosyphilis in spite of having been in malarious countries. Europeans infected by native women were just as much affected as others.

Dr. **Gladys Sandes** opened a discussion on

Methods and Results of Dealing with Antenatal Venereal Diseases.

She analysed 1000 consecutive deliveries from the maternity department of the London Lock Hospital since 1920, and also 34 from the Highbury Hostel attached to the Royal Free Hospital. She concluded from her analysis that syphilis acquired after the fifth month of pregnancy ought not to affect the child so long as the mother was rendered non-infective before delivery; even so, she should not be allowed to breast-feed the child. No special abnormalities were observed during labour or puerperium in treated cases. Gonorrhœa might shorten the second stage of labour and at the same time predispose to rupture of the perineum if the soft tissues had been softened by hot baths and douches during treatment. Puerperal complications were rare. In nearly every case of ophthalmia there had been early rupture of the membranes, prolonged labour, or only a small amount of antenatal treatment for the mother's gonorrhœa.

So long as sufficient time was given to treatment the results seemed to be satisfactory whatever method was used. Pregnancy did not affect the technique of treatment for gonorrhœa, except that douches were given more slowly and at a lower pressure, and, of course, intracervical swabs could not be used. The syphilitic woman should have at least one course of arsenobenzol compounds before delivery. Ideally she should have six weekly injections of 0·6 g. novarsenobillon or its equivalent; an injection of 0·125 g. contramine after the fifth and seventh injections was especially useful for patients likely to react unfavourably to arsenic. A course of bismuth should be given afterwards, or concurrently. Mercury injections were usually painful to pregnant women, but pills could be given in the later half of pregnancy. Bismuth injections were non-painful, efficient, and very safe. If the W.R. came down to plus 30 before delivery, the baby would probably be free of disease; if it was plus 120 or plus 240 the baby would probably be a congenital syphilitic. Any mother who had syphilitic changes in her cerebro-spinal fluid would almost certainly bear a syphilitic baby. The incidence of congenital syphilis was due primarily to the absence or inadequacy of treatment during pregnancy, and therefore an educated public opinion was obviously of great importance in its eradication.

The Elsie Inglis Memorial Hospital.

Dr. **Mary Macnicol** described methods and results at this Edinburgh hospital, where there was a ward *for ten patients and two out-patient clinics*. She emphasised the importance of having wards and clinics for cases of venereal disease attached to every maternity hospital. Amazingly good results followed the effective treatment of syphilis, but the prognosis in gonorrhœa only justified humility and a dogged determination to "make the best of a bad job." It was extremely important to take a blood test from every pregnant woman and to give treatment in every subsequent pregnancy to a woman who had ever had syphilis. Even partial treatment was of great value. The full course given was six weekly injections of 0·3 g. N.A.B. intravenously, and then one monthly injection of 0·45 g. A mixture of grs. 10 of potassium iodide and ʒi of liq. hyd. perchlor. was given thrice daily. Sulfarsenol was given intramuscularly in some cases, but the women preferred the intravenous injections. Bismuth was reserved for the interval between pregnancies to avoid strain on the kidneys.

In Dr. Macnicol's view the only satisfactory as of the treatment of gonorrhœa was the preven of ophthalmia neonatorum. The danger to th child from antenatal gonorrhœa had been large removed, but the mother ran the threefold risk puerperal infection, later chronic cervicitis, end metritis or salpingitis, and subsequent sterility. It was important to avoid the use of instruments for induction or during confinement and to avoid all lacerations of the birth passage. At the Elsie Inglis Hospital the cases were carefully followed up, and the impression was held that careful antenatal treatment did much to prevent postnatal complications. Lactic acid, mercurochrome, and glycerin had been found the most useful drugs, and vaccines were being used increasingly. No douching or swabbing was done for the first ten days after the birth, but free drainage was encouraged by raising the head of the bed. Where induction was necessary and drugs could not be used, the membranes were manually separated and the vagina packed with gauze soaked with mercurochrome.

An interesting paper by Dr. G. G. **Butler** and Dr. G. M. L. **Summerhayes** discussed antenatal yaws and syphilis in Accra, Gold Coast.

Dr. **David Nabarro** read a paper on the prevention of inherited syphilis by treatment of the mother. He mentioned special Swedish hospitals for syphilitic mothers, and said that 20 beds at St. Margaret's Hospital had now been set aside for the residential treatment of pregnant women.

Dr. **Margaret Balfour** and Dr. **Myrtle Noronha** communicated papers on the antenatal treatment of syphlis and the care of the syphilitic mother and child in India, and a brief discussion followed on the advisability of subsidising government hospitals for this purpose.

THE BRITISH EMPIRE CANCER CAMPAIGN.

THE YEAR'S PROGRESS.

THE annual general meeting of the Campaign was held on July 20th at the House of Lords, Lord Reading presiding. The annual report consists of a substantial volume of some 200 pages, mostly made up of accounts submitted by subsidised institutions and individuals of the progress achieved during the year under review. The usual foreword, signed by Lord Reading as chairman of the Grand Council, drawing attention to certain results obtained, has this year an added value, in so far as it is supplemented by page references to the fuller accounts by the actual observers.

Notes on the extensive experimental, clinical, and pathological investigations on the action of radium and X rays, which are being actively pursued in many centres, take up a considerable part of the annual report. Apart from these, among the more outstanding contributions made to the cancer problem by workers connected with this Campaign, the progress of which has not recently been recorded in our columns, are the production of cancer by a pure chemical substance (see p. 197), the detoxication of carcinogenic mineral oils, and the demonstration of hereditary factors in certain forms of cancer in humans.

DETOXICATION OF MINERAL OILS.

In Manchester, under the direction of Dr. C. C. Twort, special attention has been given to the investigation of the causes of mule spinners' cancer, and especially to the cancer-producing properties of mineral oils and the possibility of removing harmful compounds from them in such a manner that they can be used commercially without increasing their cost or diminishing their lubricating qualities. Investigations on the effect of the treatment of mineral oils with sulphuric acid indicate that though a very large quantity of acid must be used in order completely to detoxicate carcinogenic mineral oils, smaller amounts such as 10 per cent. by volume are capable of materially lessening the potency of lubricating oils. The committee recommend that the owners of mills should mix into their lubricating oil the necessary quantity of sperm oil or lanolin, and preferably use mineral oil which is as far as practicable saturated. The practical utility of other methods of detoxication, such as exposure to ultra-violet light and radon, appears to be doubtful.

THE HEREDITARY FACTOR IN POLYPOSIS INTESTINI.

At St. Mark's Hospital special attention has been directed to the disease known as multiple adenomata, multiple papillomata or polyposis intestini, a condition in which the mucous membrane of the colon and rectum is studded with adenomatous epithelial proliferations.

Investigations have shown that polyposis intestini is an inheritable disease which is transmitted by both males and females, that both males and females suffer from the disease, and that the inheritance can be traced through several generations. If members of these families survive the other complications of polyposis and ordinary risks of life, they develop cancer of the rectum or colon, usually in the early thirties or forties.

THE EFFECT OF IMMUNE SERA ON CANCER CELLS.

In the Cancer Research Laboratory of the London Hospital, Dr. T. Lumsden has tested a large number of different drugs, bodily secretions, radiations, and other reagents such as heat and cold, on tissue cultures of cancer cells and of normal cells. The only reagent he was able to produce which killed cultured cancer cells without damaging normal body cells seriously, was an antiserum produced by inoculating into an animal the cancer of a different species of animal and then testing this antiserum upon tissue cultures made from a third species of animal. Unfortunately, however, attempts to apply these results in treating cancerous mice failed, for the antiserum could not be injected in a degree sufficiently concentrated to destroy the cancer without causing the death of the mouse. However, such sera can be separated into fractions of which one fraction contains practically all the anticancerous elements in the serum and is much less toxic when inoculated into living animals than the original anti-cancer serum from which it was made. When an implanted tumour is destroyed by inoculating this refined anti-cancer serum into it, gradual reabsorption of the tumour cells occurs and during the process the tumour-bearing animal is rendered immune to recurrences. It is stated that preliminary results of treating mouse cancer, both implanted and spontaneous, raise the hope that ultimate success may be achieved along this line of inquiry, but at the moment consistently good results cannot be achieved. Treatment by anti-cancer serum is not at present applicable to human tumours.

X RAYS AND RADIUM.

X rays and radium have been used not only in experimental therapeutics and in the attempt to discover the way in which they act on biological material, but also to test the nature of the material on which they act. For example, among the pathological investigations at the Middlesex Hospital, the destructive effects of β-radiations upon the following bodies have been examined: the infective agent of the Rous sarcoma, the bacteriophage, several types of pathogenic bacteria, some ferments, antibodies, and toxins. The results appear to indicate that the Rous sarcoma agent is not of the nature of a ferment; they do not, however, exclude the possibility that it may be a non-living agent of complex-protein nature somewhat similar to certain toxins.

Among the inquiries pursued in the radiological research laboratories of this hospital are those on the physiological effects of penetrating X rays on animals; the scattering effects of X rays and Gamma rays in different media; and the reactions of the tissues under different degrees of filtration of radium rays. The best filter for all purposes is held to be platinum. At St. Bartholomew's Hospital the effects of radium on the cerebral tissues of the rabbit are being studied by Dr. E. A. Carmichael and Mr. J. Paterson Ross. Radon seeds inserted within the dura mater, radon seeds placed upon the dura mater, and radium needles placed upon the dura mater were the methods investigated. In discussing the clinical problem of treating cerebral gliomata with radium, it is noted that the greatest problem in treating a brain tumour with buried radium is the difficulty of determining the extent of the tumour. In dealing with tumours in other parts of the body it has been found that it is only when the radium can be placed accurately around the growing edge that satisfactory results are obtained. It is so seldom possible to achieve this accuracy in the brain that, it is said, some alternative method may have to be employed, perhaps distance irradiation. It would appear, however, from the reports of workers at the Westminster Hospital, on results obtained with the four-gramme bomb, that this is unlikely to be the method of election in applying distant radiation. Prolonged treatment by this means causes pathological changes in the blood. Histological examination revealed gross damage to spleen, kidney, and lung in every case coming to post mortem after considerable "bomb" treatment, while not a single "bomb"-irradiated cancer could be regarded as cured when examined under the microscope, though several cancers of the breast and uterus had been demonstrated to be comparatively inactive after treatment with needles.

Dr. Warnford Moppett, working in the University of Sydney, has continued his investigations into the biological effects of homogeneous beams of X rays. He has completed studies (*a*) in relation to a phenomenon termed antagonism, (*b*) in relation to the area of tissue radiated, and (*c*) in relation to time. The phenomenon termed antagonism implies a neutralisation between different components of mixed radiation in their biological action. This was deduced from the fact that the allantoic membrane of the chick is about 1000 times more sensitive to homogeneous radiation than to mix radiation. Dr. Moppett has devised a new type of X ray tube, made of metal, with which it is possible to obtain a more homogeneous beam of X rays with a wave-length approximating to the K discontinuity of radium.

Observations of considerable interest have been made by Miss D. Goulston, also working at Sydney, who has applied the radiations from radium to the chorio-allantoic membrane of the chick embryo. When this membrane is irradiated through a window cut in the shell, a pure hypertrophy of the membrane is produced, not uniformly, but in situations determined by the shape of the opening in the shell. Further, in irregular situations, extraordinary hypertrophy of the endoderm, leading to the formation of papillary tumours, multiplication of the ectoderm leading to apparent patchy epitheliomatous structures, and areas of intense hæmopoieses occur. The results of experiments suggest that these results are not due to the gamma radiation from the needles but possibly either to a modified radiation of longer wave-length, or an action due to secondary waves originating from the components of the shell.

These few samples of the work being done show the activity of the Campaign not only in this country but in its branches and affiliated organisations in the dominions. This report indicates more clearly than any of its predecessors the range and growth of the problem and should stimulate a generous measure of public support.

THE BRITISH PHARMACEUTICAL CONFERENCE.

THE conference met this year at Manchester on July 21st and 22nd. The chairman, Mr. J. H. FRANKLIN, in his address made allusion to the industrial depression in Lancashire and to the possibility that scientific research may provide a solution of the pressing problems of the day; Manchester was associated with the names of many famous men of science, notably Joseph Priestley, Thomas Priestley, John Dalton, and James Prescott Joule.

More than 20 papers were contributed in the Science Section, some of which are here summarised.

POTENCY OF DIGITALIS TINCTURES.

In a paper from the Pharmacological Laboratory of the Pharmaceutical Society on the Variations in Potency and Total Solids of Tincture of Digitalis, Mr. FRANK WOKES said that some analysts had gone so far as to suggest limits of total extractives for tinctures of potent drugs whose active principles cannot yet be determined chemically. He showed the danger of such procedure by means of data obtained on tincture of digitalis; examination of 100 different commercial tinctures showed that there was no definite relationship between the potency and the total solids. The biological assays were all done by the cat method. During the same period in which the 100 commercial tinctures were examined, 24 different samples of digitalis leaves were assayed by the cat method. Eighteen of these samples were British grown and six foreign. The potency of the commercial tinctures ranged from 49 to 200 per cent. of that of the standard tincture and the 24 different samples of digitalis leaf showed a smaller range of potency (63 to 156 per cent. of that of the international standard digitalis powder), but practically the same average potency as that of the 100 tinctures. If percolation is efficient no satisfactory sample of leaf should yield a tincture weaker than about 60 per cent., and English leaves will, in most cases, give tinctures more potent than the standard tincture.

TESTS FOR ERGOT ALKALOIDS.

In collaboration with Mr. H. CROCKER, of the Department of Inorganic Chemistry, Liverpool, Mr. WOKES also contributed a paper on Biological and Spectroscopic Tests on Ergot Alkaloids. The authors gave an account of an attempt to apply the spectroscope to the assay of ergot alkaloids. Parallel tests on solutions of the alkaloids by both biological and spectroscopic methods had shown that they cannot be relied upon to give the same results when estimating the activity of either fresh or deteriorated ergot preparations. Hence the spectroscope could not replace the biological method.

THE SOLUBILITY OF CALCIUM.

Mr. H. BRINDLE (Pharmaceutical Department, Manchester University) dealt with the problem of solutions of calcium, and described a process for the extemporaneous preparation of this product. Calcium lactate is now preferred by many prescribers when a calcium salt is required. It is frequently prescribed in mixtures, and because of the varying solubility of the commercially available article, a clear solution or a mixture containing varying amounts of calcium lactate in suspension may result when the same prescription is dispensed with different samples of calcium lactate. Some prescribers attempt to overcome the difficulty by ordering *Calcii lactas recens.* Since none of the standard text-books consulted gives any information on the method to be adopted, Mr. Brindle's process fills a gap.

The same author contributed a paper on the Volumetric Assay of Lactic Acid B.P. The work therein described was undertaken because a subcommittee of the Pharmacopœia Commission have suggested some modifications in the official process.

FRENCH TINCTURE OF IODINE.

Mr. J. M. WALMSLEY (laboratory of Messrs. J. Woolley, Sons and Co.) referred to a statement in the report of the Pharmacy Subcommittee to the Pharmacopœia Commission, that a new preparation of iodine is required corresponding to the so-called "French tincture of iodine. There was said to be a demand from the medical profession for a solution for the exhibition of free iodine which does not contain any iodine in combination, since it was held that solutions containing iodides were more liable to give rise to iodism than a solution containing iodine alone. Experiments carried out by Mr. Walmsley on a sample of the proposed French tincture of iodine showed that during three months there was a loss of about 15 per cent. of free iodine. In his view it was an error to recommend such an unstable preparation as a simple alcoholic solution of iodine. He believed that the requirements of solutions of iodine are met by the two solutions at present official—tinctura iodi mitis and tinctura iodi fortis.

THE DISPENSING OF SYRUPS.

Some notes on Syrup of Senna were contributed by Mr. THOMAS MCLACHLAN. Many of the present syrups of the Pharmacopœia, he said, are liable to ferment, and it suggested that more rigid standards should be adopted i the forthcoming pharmacopœia, both as regards manufactu and standardisation of the final product. He referred to the practice of dispensers of rinsing bottles under the tap immediately before dispensing; the result is that water left in the bottles when these are emptied carelessly. Som syrups and elixirs are prepared carefully with an extremel narrow margin between the amount of sugar necessary prevent either crystallisation or fermentation, and it therefore necessary that such syrups should be dispensed dry bottles.

CAFFEINE AND THEOPHYLLINE.

Messrs. P. A. W. SELF and W. R. RANKIN (laboratorie Messrs. Harrison and Self) quoted experiments wh illustrated suitable conditions, and the degree accuracy obtainable, in the preparation of caff from theobromine and theophylline by methylation w dimethyl sulphate. It has long been known that caffe can be prepared readily from theobromine, but no sim method has hitherto been published by which theobrom can be converted into caffeine with sufficient care a accuracy to serve as a method for the determinatio theobromine.

Mr. G. W. FERREY (laboratories of James Woolley, Sc and Co.) contributed a paper on the Theophylline Sodi Acetate of Commerce. One of his objects was to point the need for careful examination of parcels coming for as theophylline sodium acetate, as substitution of t article by the isomeric compound theobromine sodium acet appears to be fairly frequent. One of the consequences such substitution is that the use of theobromine as theoph line would lead to unexpected clinical results, depriving th patient of the proper treatment.

TESTS FOR MERCUROCHROME.

Mr. H. A. MITCHELL (laboratories of Evans' Biologic Institute) read a paper on the Correlation of Chemical and Toxicity Tests on Mercurochrome. The standardisation of mercurochrome involves not only a determination of it germicidal power, but, what is more important, of its toxicity. Wide variations in toxicity occur, and the author's observations lead to the hope that at a later date more uniform batches of pure mercurochrome may become available.

ESTIMATION OF MOISTURE BY DISTILLATION.

Mr. G. MIDDLETON (laboratories of the British Drug Houses Ltd.) contributed a paper on the Estimation of Moisture by Distillation. An apparatus is described in the paper and a figure, drawn to scale, demonstrates its applicability whereby the true moisture contents of drugs can be determined with a greater degree of accuracy than by the drying method.

Mr. T. TUSTINE COCKING, from the same laboratories, read a paper on the Assay of the Official Balsams, and described a new method.

Other Communications.

Mr. F. J. TODD (laboratories of Messrs. Heynes Matthew Ltd., Cape Town) made suggestions for improvements in the present official monograph on solution of bismuth and ammonium citrate with reference to the method of preparation. The same author contributed some notes on mercuric nitrate ointment and *Liquor Eastonii.* He explained a method for the preparation of the ointment, which produces a substance with keeping properties superior to those of the official ointment.—Messrs. NORMAN GLASS and A. I. JONES (laboratories of Messrs. Evans Sons Lescher and Webb) contributed a paper embodying work carried out with the primary intention of selecting acids suitable for use in the manufacture of Lysol.—Messrs. L. A. HADDOCK and NORMAN EVERS (laboratories of Messrs. Allen and Hanburys) recommended a method for the determination of strychnine in Easton's Syrup.—Mr. C. MORTON (Chelsea School of Pharmacy) read a paper on the Hydroxy-Acid Complexes of Iron. He expressed his indebtedness to the Senate of the University of London for a grant from the Dixon Fund.—Messrs. ALAN H. WARE and VICTOR SMITH contributed a paper on the Systematic Qualitative Analysis of Powders and Extractives.

PANEL AND CONTRACT PRACTICE

EFFECT OF DANGEROUS DRUGS RESTRICTION.

IF the Home Office withdraws a medical practitioner's authority to possess or prescribe certain drugs under the Dangerous Drugs Regulations, is he thereby prevented from giving efficient medical service to insured persons? Must his name thereupon be automatically removed from the medical list? To these interesting and possibly novel questions the Minister of Health has answered "No." The Minister accepts the findings of the inquiry committee which recently investigated a representation on this point made by the Middlesex insurance committee. In those findings the inquiry committee has carefully examined the obligations of the practitioner under the Terms of Service scheduled to the Medical Benefit Consolidated Regulations, and has come to the conclusion that the restrictions imposed on the practitioner by the Home Office need not prejudice the efficiency of the medical service to the insured.

In the case which raised the question the facts were not in dispute. A most important element in the case was the absence of any evidence that any insured person had suffered by reason of the Home Office withdrawal of the practitioner's authority under the Dangerous Drugs Regulations. The effect of the Home Office order is that the practitioner cannot possess, supply, or prescribe morphine, cocaine, ecgonine, diacetylmorphine (or heroin), or their respective salts, medicinal opium, or any extract or tincture of Indian hemp, or any preparation, admixture, extract, or other substance containing any proportion of diacetylmorphine, or containing not less than one-fifth per cent. of morphine or one-tenth per cent. of cocaine or ecgonine. The respondent practitioner argued that, as he could still lawfully prescribe weaker percentages of morphine and cocaine than those specified in the Home Office order, he could manage for all practical purposes to carry out the duties of panel practice; it was true that he could not prescribe heroin in any proportion whatever, but he contended that heroin was unnecessary and could be replaced by the diluted preparations of morphine, which he was still allowed to prescribe. The inquiry committee agreed that the inability to possess, supply, or prescribe ecgonine or heroin or their respective salts was not fatal to the panel doctor. Ecgonine, they remark, is not in practice used by doctors, and all the therapeutic purposes of heroin can be served by morphine in dilutions under one-fifth or by codeine. Similarly, they continue, extract and tincture of Indian hemp are very little used, and there are satisfactory substitutes. As to morphine and its preparations, the inquiry committee report states that the practitioner could satisfy all his ordinary medical needs by prescribing in strengths below one-fifth per cent. As to cocaine, permitted substitutes, such as novocain, would suffice. As to medicinal opium and its preparations, the respondent practitioner would be able to supply or prescribe these substances by a judicious use of the 15 preparations of opium exempted from the regulations and contained in the Third Schedule of the Dangerous Drugs (Consolidated) Regulations of 1928, and also by using the other forbidden preparations with the permitted dilution (below one-fifth per cent. of morphine). The material passages in the Terms of Service are paragraphs (8) and (10) of Article 9. Paragraph (10) ("duty to prescribe") requires the practitioner to order "such drugs . . . as are requisite for the treatment of any patient." Paragraph (8) ("duty to supply drugs and appliances"), sub-paragraph (*b*), requires him "to supply to a patient where requisite . . . drugs . . . required for immediate administration or application, or required for use before a supply can conveniently be obtained otherwise under the [Medical Benefit Consolidated] Regulations." The inquiry committee thinks (and the Minister agrees) that the Home Office withdrawal of the practitioner's authority does not prevent compliance with the foregoing terms. But there remains sub-paragraph (*a*) of paragraph (8), which requires the practitioner to "supply to the patient, where requisite, drugs which are necessarily or ordinarily administered by a practitioner in person." This provision in the Terms of Service is a much more awkward obstacle. How, for example, is the panel doctor to administer a hypodermic injection of morphine when his authority to possess, supply, or prescribe morphine in such concentration as is necessary has been withdrawn? The necessity to administer morphine in this way, say the inquiry commiteee, is rare, and, perhaps, might not occur in ordinary insurance practice oftener than five or six times a year; but it is of vital importance. The only way of circumventing this obstacle, they conclude, is for the restricted practitioner to call in the assistance of a medical colleague who is not under a similar disability. They think the restricted practitioner can give adequate treatment if he has "a satisfactory working agreement with a colleague to meet a somewhat rare emergency." They apparently do not regard such a course as more objectionable than the not uncommon arrangement for surgical operations which are adjudged to be within the ordinary general medical practitioner's competence and are, therefore, within the terms of the insurance doctor's service, but which certain individual practitioners find themselves unable or unwilling to carry out personally.

It is thus possible to state as an abstract proposition that withdrawal of authority under the Dangerous Drugs Regulations by the Home Office does not mean the automatic removal of an insurance doctor's name from the medical list by the Minister of Health. Perhaps the warning should be added that the withdrawal of authority may nevertheless be a significant element in some future case where an allegation of specific inefficiency of treatment has emerged. The restricted practitioner may then be represented as working at a disadvantage which can only be removed by skilled and judicious use of permitted drugs to supplement the restricted resources. In the recent case under discussion the practitioner was in a strong position; as there was no evidence that any of his patients had suffered by reason of the restrictions, it was difficult for the tribunal to find that the medical service was inefficient.

EXCESSIVE SICKNESS CLAIMS.

Dr. G. H. CRISP (Oakham, Rutland) writes: "In your issue of July 18th there are two interesting statements. On p. 153 is the now hackneyed diatribe against the panel practitioner by Mr. S. Comyns Carr, K.C., on the issue of alleged fraudulent certificates. On p. 144 is a short account of one of the discussions at the joint conference of the British Hospitals Association and the Incorporated Association of Hospital Officers, at Eastbourne, in which it is stated that the number of patients attending the London teaching hospitals has risen by 10 per cent., and the individual attendances by 30 per cent., since 1920. As we are assured by the approved societies that there has been no increase in sickness, we must conclude that the hospitals also are participants in the alleged fraud. It is difficult to see that they derive any benefit from their lamentable conduct."

CORRESPONDENCE

PRIORITY IN NEUROLOGICAL SURGERY.

To the Editor of THE LANCET.

SIR,—May I, as one of Victor Horsley's former pupils and colleagues, do a tardy justice to his acknowledged greatness both as a neurologist and a surgeon, by pointing out in your columns the inaccuracy of the oft-repeated claim in American publications that Spiller of Philadelphia, in 1898, was the *first* to suggest section of the sensory root of the fifth nerve for the relief of trigeminal neuralgia?

I am the more prompted to do so by the appearance in the *Journal of the American Medical Association* (March 21st, 1931) of the latest article of many by Dr. Charles Frazier, in which he continues to advance this claim, and further states: "The first purposeful section of the sensory root for the relief of trigeminal neuralgia was performed in this clinic." Neither of these claims can be substantiated. For it was Victor Horsley who first suggested the procedure and who first carried it out, exactly eight years prior to the appearance of Spiller's suggestion contained in his paper, written in collaboration with W. W. Keen, in the *American Journal of Medical Sciences*, for November, 1898.

In the *British Medical Journal*, of Dec. 12th, 1891 (p. 1249), in the last of three consecutive articles written in collaboration with Dr. James Taylor and Dr. W. S. Colman, Horsley says:

> "In considering the possibility of relieving cases of inveterate neuralgia, when recurrence of pain had taken place—i.e., after peripheral operations, I thought that one might be able to remove the Gasserian ganglion, *or divide the fifth nerve behind it* (italics mine), and I made, some years ago, dissections to see how far the Gasserian ganglion could be separated from the cavernous sinus. Finding this to be the case (that complete removal of the Gasserian ganglion is not possible) I then considered the possibility *of dividing the fifth nerve behind the ganglion* (italics mine). On trying this on the dead body, I found that it was perfectly feasible."

Horsley then proceeds to describe very fully the various steps of the operation, done on Dec. 11th, 1890, which he deliberately undertook and performed for attacking the sensory root behind the ganglion. Further, in the *Clinical Journal*, of Nov. 3rd, 1897, he refers again to this case and says:

> "In 1890, after consideration of the whole question in a very severe case, I determined to divide the nerve roots behind the ganglion. To attain this object (post-ganglionic section) I endeavoured to raise the temporo-sphenoidal lobe, and succeeded without much trouble in detaching the sensory root from the pons."

I am sure that it will need only this letter to secure from our American confrères their ready and generous acknowledgment of Horsley's priority in both suggesting and carrying out the operation of section of the sensory root for the relief of trigeminal neuralgia.

I am, Sir, yours faithfully,

Harley-street, W., July 15th, 1931. DONALD ARMOUR.

ACUTE ASEPTIC MENINGITIS.

To the Editor of THE LANCET.

SIR,—I was greatly interested in the paper by Dr. John Gibbens in your issue of July 4th, for at the end of last year I saw what must have been a case of acute aseptic meningitis, and had remained in doubt as to the diagnosis.

The patient, a boy aged 6, was taken acutely ill on the night of Oct. 27th with abdominal pain, fever, vomiting, and headache. The onset was so sharp, and the abdominal symptoms so predominant, that it [illegible] considered wisest to explore the abdomen, and [illegible] somewhat congested and œdematous appendix [illegible] removed. However, the symptoms persisted, and I [illegible] asked to see the child on Oct. 31st. By that time the signs of meningeal irritation were well marked; the child was irritable, lying curled up, with head slightly retracted, rigid neck, and periodic vomiting. Otherwise there were no abnormal signs.

The cerebro-spinal fluid was under only moderate pressure. Dr. Eric Wordley reported on it as follows:—

> "A turbid fluid, containing obvious pus. No clot present. Cells numbered 80 per c.mm.; 95 per cent. polymorphs; 5 per cent. lymphocytes; protein, 60 mg. per cent.; chlorides, 71 mg. per cent. No organisms were found in the stained films and cultures were sterile."

The boy seemed better as a result of the lumbar puncture, and this was repeated four days later, the cerebro-spinal fluid showing no change.

For two weeks the case ran an extraordinarily variable and irregular course. On some days the temperature would rise to 102°, and headache, vomiting, and general irritability recur with severity; on other days the fever would be slight, only reaching 99°, and the boy would sit up and play with his toys and talk perfectly rationally. His general condition remained remarkably good throughout.

On Oct. 11th there was complaint of a little tenderness over the left mastoid, with slight enlargement of the left pupil and weakness of the left face; but no other evidence pointing to disease of the ears was found. On that day I gave an injection of 1 c.cm. sodium nucleinate solution, and after a slight reaction the temperature fell to normal and the pulse-rate to 88, and remained at these levels for two days. Then headache and vomiting recurred, and the temperature rose to 102°. I repeated the nuclein, therefore, 0·5 c.cm. daily for a week, and at once the temperature and pulse returned to normal, and the child made an uninterrupted recovery. A lumbar puncture on Nov. 24th gave a clear cerebro-spinal fluid containing a slight excess of protein, and a definite excess of cells (total count not done), 90 per cent. of which were lymphocytes.

In every way the case agrees with those described under the title "acute aseptic meningitis."

I am, Sir, yours faithfully,

Plymouth, July 17th, 1931. W. A. LISTER.

LATENT MAXILLARY SINUSITIS.

To the Editor of THE LANCET.

SIR,—Dr. R. Paterson's lucid and most instructive paper in your last issue (p. 117) wisely stresses the possibility of antral infection being totally unsuspected. During the last two years I have habitually subjected these cavities to transillumination in the course of a routine physical examination, and have notes of 11 cases in which one or both antra were opaque and in which no local symptoms whatever were present. Four of the patients suffered from chronic arthritis, two from bronchitis, two from angina pectoris, one from duodenal ulcer, one from hyperpiesia, and one from asthma. Pus was present in two arthritics and one bronchitic. The latter's chest condition cleared up as the result of antral drainage, but the former two showed no general improvement. Of the remaining cases, exploratory puncture produced no pus, but the wash-out fluid was turbid, and contained *Streptococcus viridans* in three, *Micrococcus catarrhalis* seven, and was sterile in one anginal patient. A ypoid mucous membrane was found in the cases of hma and duodenal ulcer, the other antra being eated by wash-outs only. The asthmatic showed no improvement; this is usual. The ulcer, of course, healed on the usual medical treatment, and it is doubtful whether clearance of the antrum had any general beneficial effect.

Although it is probable that many cases of latent maxillary sinusitis are no better, as regards general health, for its discovery and treatment, yet there remains a considerable fraction of unsuspected instances of this condition in which suitable treatment will result in the disappearance of diverse maladies.

In nearly every case adequate transillumination can be obtained by the use of a convenient and inexpensive electrically lighted tongue depressor in conjunction with a good dry battery (I use one supplied by F. Davidson and Co., Great Portland-street), both of which can be carried round with ease, and in fact used for the normal examination of mouth and throat.

I am, Sir, yours faithfully,

A. H. DOUTHWAITE.

Harley-street, W., July 18th, 1931.

To the Editor of THE LANCET.

SIR,—Dr. Paterson's interesting and timely article deserves wide notice. As has rightly been emphasised, the symptomatology in these cases of unsuspected antral infection is usually that of some secondary complication. In a paper read before the Tuberculosis Association last year,[1] I emphasised the fact that cases of secondary "catarrhal" chests ("catarrhal apices," &c.), following antral infections and sepsis generally in the upper air passages, are constantly being notified as tuberculous because of symptoms such as cough, blood-stained expectoration, general malaise, loss of weight, and sweating. If the upper respiratory tract were examined as a routine procedure in every chest case, such a misfortune, no doubt, would be avoided.

The continuity of the whole of the respiratory tract should require little emphasis. Nevertheless, there is an unfortunate tendency to divorce the upper and lower respiratory tracts and treat them in isolated compartments, and the absence of team-work between rhinologists and physicians is to be deplored. Whilst the consequences of a diagnosis of the pulmonary complications of antral infections such as pulmonary tuberculosis may indeed be serious for the patient, we must furthermore recognise that failure to detect latent maxillary sinusitis is responsible for the development of many cases of bronchiectasis and other serious pulmonary complications, the lungs serving as "cesspools" for upper respiratory tract discharges. There is, therefore, urgent need for: (1) More serious team-work by physicians and rhinologists in order that the more distant symptoms of a focal infection shall be recognised. (2) The recognition of an elementary principle—that no examination of the chest is complete unless it includes an examination of the upper air passages, and that in both branches the fullest use of clinical and radiological methods should be employed.

Whilst I have limited my remarks on latent antral infection to its pulmonary complications, its significance in almost every branch of medicine has been illustrated in Dr. Paterson's admirable paper.

I am, Sir, yours faithfully,

Harley-street, W., July 20th, 1931. PHILIP ELLMAN.

A CASE OF IODISM?

To the Editor of THE LANCET.

SIR,—An unusual case of what appears to be iodism came to my notice last week. A man, aged 42, and, a few days later, his wife, came to me complaining of a sore tongue. I was at a loss at first to account for this, as there were no signs of dyspepsia or history of excessive smoking in either case, and the usual remedies gave very little relief.

On her second visit, the wife mentioned the hitherto forgotten symptom, common to both herself and her husband, of a metallic taste in the mouth. I knew they were taking no medicine containing iodine or iodide, and at first could not account for this. On inquiry as to the salt used in the household I was told that for the last 12 months "iodised" salt had been used.

Can the cumulative effect of an unknown dose of iodine or iodide used in the preparation of this commodity have caused the taste in the mouth and the sore tongue in these cases? Also, could it account for some of the cases of acne one treats with very little knowledge as to cause, and lack of response to treatment?

I should be glad to know of any other cases similar to my own.

I am, Sir, yours faithfully,

KATHLEEN BLAKE, M.R.C.S., L.R.C.P.

West Wickham, Kent, July 15th, 1931.

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[1] See THE LANCET, 1930, i., 628.

INSULIN PHOSPHOTUNGSTATE BY MOUTH.

To the Editor of THE LANCET.

SIR,—In your issue of Jan. 24th (p. 184) Dr. R. D. Lawrence reported clinical results with oral administration of insulin phosphotungstate as proposed by H. N. Mukhirjee.[1] Having tried the preparation on two cases, Dr. Lawrence failed to observe any lowering of the blood-sugar. About the same time Dr. E. G. B. Calvert tested the substance on a case at the London Temperance Hospital, and the results we obtained were in agreement with those of Dr. Lawrence. The tests were carried out as follows:—

Having first found by a blood-sugar curve the effect of 25 g. of glucose administered to the diabetic patient fasting, a few days later the same patient fasting was given 25 g. glucose and 100 units of insulin phosphotungstate orally, and the sugar curve was again plotted out. A week later the sugar curve was obtained after substituting 25 units of insulin hypodermically for the insulin phosphotungstate, while a fourth curve was obtained after the patient had taken 600 units of insulin phosphotungstate by the mouth. The following are the figures obtained, the same patient being tested and 25 g. of glucose being taken, fasting, on each occasion.

	1	2	3		4
—	Without insulin.	100 units insulin phosphotungstate orally.	25 units insulin hypodermically.	—	600 units insulin phosphotungstate orally.
Fasting ..	0·218	0·252	0·218	Fasting ..	0·252
½ hour ..	0·296	0·282	0·228	½ hour ..	0·301
1 hour ..	0·38	0·34	0·247	1 hour ..	0·36
1½ hours ..	0·365	0·345	0·252	1½ hours ..	0·394
2½ hours ..	0·355	0·267	0·169	2 hours ..	0·336
3½ hours ..	0·326	0·267(?)	0·081	3 hours ..	0·291
4½ hours ..	0·267	0·242	0·11	4 hours .	0·272

The insulin phosphotungstate was prepared by Messrs. Allen and Hanburys, Ltd.

As the subject is of considerable importance, I am, with the concurrence of Dr. Calvert, sending you these results of our investigations.

I am, Sir, yours faithfully,
HAROLD H. SANGUINETTI.

Hornton-street, W., July 20th, 1931.

RECTAL HÆMORRHAGE IN UNSUSPECTED TYPHOID.

To the Editor of THE LANCET.

SIR,—I have just read with great interest Mr. Hamilton Bailey's note in your issue of June 13th on three cases of Alarming Rectal Hæmorrhage in Unsuspected Typhoid, to which I should like to add my own recent case, referred by Dr. F. R. S. Shaw, of Tuz Khurmatu, which on arrival from up-country had passed the alarming stage, and presented a problem for diagnosis. I cannot do better than quote Dr. Shaw's note of Dec. 16th, 1930:—

> Yesterday afternoon Mr. A. was feeling a little faint while working and was suffering from a good deal of flatulence, but was otherwise all right. Later in the evening, he felt rather full in the stomach and still suffered from flatulence. He vomited twice and had three motions. He describes the vomit as coming up easily without any straining or pain, and says it was dark coloured. About 2.30 A.M. I was called out and found him lying in bed in a collapsed condition, cold, very pallid, with a feeble rapid pulse, just like a person who has had a severe hæmorrhage. The history he gives me is as follows: About half an hour previously he had been out to the latrine, had vomited a little and had had a motion much the same as in the afternoon. On returning to the bathroom, he started to pass a very large watery motion without having any control over it. To avoid soiling any place, he sat on the edge of the tin bath and just let everything pass. He then collapsed, but managed to call the person next door, who roused me. There was some water in the bath, so that it was very difficult to see what the motion was like. However, he soiled his pyjamas badly, and it looks to me to be a black pasty material, something like iodex, but blacker. The other noticeable thing was its lack of odour. He gives a history of chronic flatulence, but of nothing else. I can see no reason for the colour of his motion unless it is blood. This morning his temperature is 99° and pulse 100 and feeble. Tongue dirty, and he is very thirsty. On palpation his abdomen shows nothing, but a certain fullness and possibly a little increased rigidity over McBurney's point, but that is rather indefinite. I have done a rough test with tincture of guaiacum and ozonic ether on the stained pyjamas and get a positive reaction for blood.

On admission at 6 P.M. on Dec. 16th the temperature was 99° F., the pulse-rate 76, and the general condition as described by Dr. Shaw. On Dec. 17th, and for ten days thereafter, he passed many liquid stools containing altered blood with very small clots, and once a little recent blood. The Widal reaction on Dec. 17th was positive to *Bacillus typhosus*, *paratyphosus* A, and *paratyphosus* B 1/20–1/40 and negative to all three in 1/80–1/640. As the patient had been inoculated with T.A.B. four months previously this result could not be regarded as other then residual. The Wassermann reaction was completely negative. On Dec. 28th a further Widal showed *B. typhosus* positive 1/20–1/320, neg. 1/640, *paratyphosus* A and *paratyphosus* B remaining as on Dec. 17th, 1930. This result clinched the diagnosis. The patient did well and was discharged on Jan. 13th, 1931.

The Widal reaction is rarely a dependable clinical aid before the end of the second week. With regard to Mr. Bailey's mention of bilharzia—although lower Iraq shows a very large incidence of the urinary type of this disease, I have not seen more than half a dozen cases of the rectal form in 14 years, and in none of these was there a severe rect hæmorrhage. However, workers in Egypt where I understand, rectal bilharzia is fairly common will, I am sure, be able to make an authoritati statement on this point.

I am, Sir, yours faithfully,
G. S. WOODMAN, F.R.C.S. Edin.

The Royal Hospital, Bagdad, Iraq, July 8th, 1931.

RECOVERY FROM STREPTOCOCCAL SEPTICÆMIA.

To the Editor of THE LANCET.

SIR,—Dr. J. A. Ryle's letter requires some comment.

(1) The recovery-rate of 6 cases out of 21 from the Guy's Hospital report was quoted because these appeared to be an unselected series of cases admitted to hospital, and because, as stated by Drs. Ryle and Smith in the report, they served "once more to remind us of the gravity of streptococcal blood-poisoning." Obviously, neither the cases which occurred in the hospital, nor those from private practice (which I do not agree are a parallel series), have statistical value, since (*a*) in some of the cases the clinical diagnosis was not supported by bacteriological evidence; (*b*) in other cases it is simply stated that streptococci were found—whether or not they were hæmolytic streptococci is not mentioned; (*c*) in no case was the hæmolytic streptococcus, when found, typed; (*d*) in some of the cases there was a septic focus which could be, and was, treated surgically, while in others this was not the case; (*e*) the nature of the treatment varied.

(2) Ryle and Smith state in the report "that there are four manifestations which may be regarded

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[1] Jour. Physiol., 1930, lxx., 182. See THE LANCET, 1930, ii., 707.

as peculiarly diagnostic of streptococcal fever and as expressing, we believe, infection with a hæmolytic strain."

In view of the facts mentioned above, I am not prepared to agree that sufficient evidence has been produced that any such "diagnostic syndrome" exists for streptococcal septicæmia. Many cases of hæmolytic streptococcal septicæmia occur without one or other of the symptoms mentioned and some without any; in my opinion, any insistence on *certain clinical* features of the condition militates against the application of what is undoubtedly the most important proceeding—viz., a complete bacteriological examination of the case. How frequently *does* one hear it said, "It cannot be septicæmia," because the patient has not a certain symptom.

(3) With regard to serum treatment, the article by Ryle and Smith states that "there seems very little evidence in favour of the efficacy of serum therapy," and a considerable warning is given with regard to serum sickness, with reference to a severe and crippling case of this condition. It is not stated, however, how this case was treated with serum, nor whether the serum was concentrated or unconcentrated.

I am in entire agreement with Dr. Ryle as to the disappointing results which occur so frequently with serum therapy in cases of streptococcal septicæmia, and also that it is highly probable that the use of other types of sera was a factor in the recovery of the case which we described. I am personally quite satisfied that the change in the serum used was the determining factor in the recovery of the patient, since improvement was immediate after this, although, of course, as with every other therapeutic agent which is used, the difficulty of distinguishing between *post* and *propter* effects exists. I see many cases of diphtheria which *might* recover without the use of antidiphtheritic serum; on the other hand, they *might* die. The important thing is to investigate why, in a limited number of cases of septicæmia, serum does appear to have a specific effect, while in others it has none.

I do not agree with Dr. Ryle that a careful study of the natural history and course and variable mortality of streptococcal septicæmia will yield an advance of our knowledge of serum therapy, unless with this is combined a most exhaustive study of the various types of hæmolytic streptococci, and further investigation as to the possibility of more specific antitoxic sera for the different types than we have at the present time.

I am, Sir, yours faithfully,

A. H. G. BURTON.

Health Offices, Ilford, July 21st, 1931.

BACTERIOLOGICAL CONTROL OF MILK-SUPPLIES.

To the Editor of THE LANCET.

SIR,—Whilst the findings of Prof. McIntosh and Dr. Whitby, recorded last week in THE LANCET, are of considerable importance, it is sincerely to be hoped that they will not be the cause of any precipitate, and possibly quite unwarranted, action on the part of public authorities. In the absence of either experimental or epidemiological evidence that the two organisms mentioned have any sanitary significance, it would be advisable to defer reconsideration of the question of standard nutrient medium until the matter has been investigated further, preferably in coöperation with the large dairy companies. When the lemco-peptone-agar medium was *first recommended* by the American Public Health Association, the Milk Control Committee, of which I was a member, well recognised that this medium did *not give the total* number of organisms present, but we considered that this disadvantage was more than offset by certain advantages only to be *obtained by* the use of ingredients of comparatively constant composition (lemco and peptone).

The main desideratum as regards the control of milk counts is that the standard process shall be capable of giving approximately the same result when used by different workers; if this condition is not fulfilled, chaos and confusion will result; and other considerations must be subordinated to this until a superior nutrient medium is evolved.

The experience recorded by Prof. McIntosh and Dr. Whitby reminds me of a somewhat similar one which I encountered in Toronto during the winter of 1911–12. In addition to the standard media of the American Public Health Association, I was using a gelatin medium for making counts on the water filter effluents and during a very cold spell, when the lake was partially covered with ice, I was alarmed to find that the bacteria per c.cm. had suddenly increased from 15–20 up to several thousands, although the agar count at blood-heat and the *B. coli* content remained quite normal. Investigation showed the anomaly to be due to a psychrophilic, non-pathogenic micrococcus that was, fortunately, very susceptible to chlorine treatment, which formed the second line of defence in the system of water purification.

I am, Sir, yours faithfully,

Buxton, Derbyshire, July 21st, 1931. JOSEPH RACE.

TUBERCULOUS BACILLÆMIA.

To the Editor of THE LANCET.

SIR,—In the annotation on this subject on p. 140 of your last issue you express the opinion that it is highly desirable that Prof. Loewenstein's work should be repeated in this country. Your readers will be interested to learn that Dr. H. Moos Schwabacher has made further progress with the investigations reported in THE LANCET of May 23rd, and that she has now obtained tubercle bacilli in pure culture in three cases, using a modification of Loewenstein's original technique—I am, Sir, yours faithfully,

KENNETH ECKENSTEIN,
Hon. Pathologist to the French Hospital.

Shaftesbury-avenue, W.C.2, July 20th, 1931.

OPENING OF KING GEORGE HOSPITAL, ILFORD.—On Saturday last the King, who was accompanied by the Queen, opened the new hospital named after him at Ilford. Their Majesties also visited the Dagenham Health Centre of the hospital.

CITY MATERNITY HOSPITAL.—A committee has been appointed by the governors of St. Bartholomew's Hospital to consider a proposal for the amalgamation of the London Maternity Hospital, City-road, which was founded in 1750. The proposal is to erect an entirely new hospital either on the St. Bartholomew's estate or on an adjoining site. It is stated that the scheme would entail a capital outlay of approximately £120,000 with a maintenance cost of about £30,000 per annum. The 71 beds in the City-road Hospital are stated to be *totally* inadequate, and the suggested building would provide 130. Moreover, the noise of traffic is troublesome to the patients. St. Bartholomew's is in urgent need of a maternity hospital close by *for teaching purposes—it has only* 17 maternity beds. The site of the City-road Hospital is the property of St. Bartholomew's, and it is thought that it could be sold for about £50,000; the maternity hospital also has available money.

PUBLIC HEALTH SERVICES

LOCAL AUTHORITIES AND ADVICE ON BIRTH CONTROL.

LAST March the Minister of Health issued a Memorandum[1] on the use of local authorities' institutions for advice on methods of birth control. He finds that certain misconceptions have arisen about the views there expressed, and the Ministry has accordingly sent a supplementary circular to maternity and child welfare authorities, bringing the following points to their notice.

It is necessary, the Minister believes, to emphasise the statement in the Memorandum that the Government are advised that local authorities have no general power to establish birth control clinics as such. Under the Maternity and Child Welfare Act, 1918, their powers are limited, so far as women are concerned, to making arrangements for attending to the health of expectant mothers and nursing mothers. If an authority decides to provide facilities for giving birth control advice at a maternity and child welfare centre the use of these facilities must be strictly incidental to the purpose for which the centre is established, and they can be made available only for married women who are either expectant or nursing mothers already in attendance at the centre and whose cases further pregnancy would be detrimental to health.

If action is taken under the Public Health Acts to establish a clinic at which medical advice and treatment would be available for women suffering from gynæcological conditions, the use of any facilities provided at the clinic for giving advice on contraceptive methods must be strictly incidental to the purpose for which the clinic is established—viz., the treatment of sick persons. Only women who need medical advice and treatment for gynæcological conditions can properly be admitted to the clinic, and contraceptive advice can properly be given only to married women in attendance at the clinic in whose cases pregnancy would be detrimental to health. It is obviously desirable for a local authority to obtain the services of a medical officer specially experienced in the clinical advice and treatment needed at a gynæcological centre of this sort.

The Minister does not consider it desirable that a gynæcological clinic should be established at a maternity and child welfare centre, and if an authority is satisfied that there is need for such a clinic it should be provided in separate premises or at a hospital. Expectant mothers and nursing mothers in attendance at maternity and child welfare centres who are found to need medical advice and treatment for gynæcological conditions could then be referred to the clinic. He thinks it important that no existing officer of a local authority should be prejudiced in any way by a decision of the authority to provide facilities for birth control advice within the limits laid down in the Memorandum. This work should not be regarded as falling within the scope of the normal duties of the medical officers of a local authority, and they should be free to undertake it or decline it.

SCHOOL MEDICAL SERVICE.

—	No. on roll.	Average attendance.	Routine inspections.	Special exams. and reinspections.	Percentage of defects.
County of Warwick..	—	—	10,839	8,975	23·3
County of Brecon ..	9,076	8,103	2,639	1,316	12·31

County of Warwick.

Dr. A. Hamilton Wood discusses many topics which are in the minds of all concerned with school medicine to-day.

He notes the great extension of facilities for car and treatment that have been made in his area. He believes that the variations in the number of defecti found are largely attributable to personal factors—changes in staff yield differences in standard whic cannot immediately be made uniform. Figures fo defects of vision and other conditions not readil affected by the personal factor in diagnosis hav been comparatively constant. He suggests th the high percentage of other defects in his coun may be partly explained by the increase of thro affections, due to climatic conditions or to so nutritional defects in early childhood, leading an enlargement of the lymphoid tissue of the na pharynx, which in turn is subject to inflammat when influenced by excessive or continued rainf Dr. Wood says that as a result of his appeal in last annual report for additional medical staff Kelly was appointed last year, and he records a the recent appointment of an additional whole-ti dentist and three whole-time dental nurses. percentage of acceptances of tonsillectomy dental treatment are regrettably small. The den obtained on average only 30·4 per cent. accepta compared with 58·5 for the whole country in One obstacle which may be an effective deterrent during this period of trade depression is the charge of 1*s*. It might be urged that dental treatment is really a preventive service, and thus should be given free, as is the treatment of infectious diseases; but since the Medical Treatment Act makes some charge obligatory, the experiment of lowering the sum to 6*d*. might prove instructive.

The school dentist in his report attributes the low percentage of acceptances to the fact that a general public dental service in Warwickshire is only of recent origin; the parents are so ignorant of modern conservative methods that they have a general distrust of fillings, which they seem to view as the first step towards the destruction of a tooth. Attempts to interest parents have been unsuccessful, and since it is realised that they often follow the wishes of the children, attention has been concentrated on lectures in the schools. Head teachers have done much, and can do still more, in influencing children and parents to accept treatment. As to tonsillectomy, the reasons for a percentage of acceptances as low as 50 are thought to be: (1) that the parents discredit the advice of the medical officers; against such a view must be put the fact that the number of parents attending the medical inspections in the county is steadily increasing; (2) the charge of 5*s*.; (3) the inconvenience of taking the child to hospital; (4) the occasional discomfort and disturbing after-effects. This last factor could be diminished if all hospitals admitted patients for at least 48 hours.

County of Brecon.

The area with which Dr. H. Davies has to deal contains for a whole county a relatively small school population, and there are lacking many of the facilities found in some progressive centres of population. The authority has no special schools of any kind of its own, no nursery schools, no X ray installation for the treatment of ringworm, no organisers of physical training, and no coöperation of voluntary societies except the N.S.P.C.C. Since all such valuable agencies are lacking, and since Dr. Davies, who is medical officer of health for the county with only one assistant, has to carry out all his duties over a widely-scattered area, it would not be surprising if the ascertainment of defects were not so strict as in some other places. The fact that the percentage of children found to have defects is only 12·31 compared with 20·7 for England and Wales (in 1928), and that only three cases of otitis and defective hearing were noted, may be due not so much to the superior health in Brecon as to the exigencies of the school medical service.

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[1] See THE LANCET, 1931, i., 776.

On the subject of malnutrition, it is recorded that the committee is concerned about the physical welfare of the children. Milk is being supplied to ill-nourished children in many of the schools, and frequently cocoa also, at a cheap rate. Many of the school buildings are defective, some of them so unsatisfactory that, in the opinion of Dr. Davies, proper conditions of light, warmth, and fresh air could be obtained more cheaply by erecting new ones than by adaptation. In other places, however, quite small alterations provide marked improvements. Repainting walls in a clean light colour instead of the dark buff may not only make a room more cheerful but raise the reflective power of the walls by over 40 per cent. Cleaning has been made much easier by the removal of heavy desks and furniture and by other simple devices. He fears, however, that the benefits derived from improved school buildings are being negatived by bad housing conditions.

County of Rutland.

r. Christopher Rolleston, who is responsible for land as well as the Soke of Peterborough, is spoken in his condemnation of some of the conditions he has to cope with. He says that there is hardly a single school in the county which comes up to modern requirements, and that grossly insanitary conditions still exist in the shape of privy vaults in certain schools. The water supply also is quite inadequate, but Dr. Rolleston considers that the question of water supply to schools must wait upon a general scheme for the whole county, or even possibly for the whole of rural England. He cites many improvements made during the past few years. The new central schools are temporary buildings—"old army huts, but they seem to answer their purpose, and they have the advantage of not lasting for centuries. The hygienic ideas of one generation become the abomination of desolation of the next." He draws a striking picture of the development of the school medical service from 1910, when there was no school nurse, to the present time. The arrangements for treatment have progressed gradually during this period. During the year the committee continued the policy of asking for small payments for the various forms of treatment (other than X ray treatment) from the few parents whose means are within the prescribed income limit.

The provision for dentistry has been inadequate, but it should be possible to complete the round of the school in a year now that the working time of the dentist has been increased. The advice received from a dental expert attached to the Board of Education was that dental attendants should invariably be provided, though it was considered unnecessary that the attendant should be a trained nurse. The essential qualities were said to be adaptability, neatness, method, intelligence, and some knowledge of clerical routine. Dr. Rolleston's comment is that such paragons are not easily to be found. He adds that the committee "provided the school dentist with help which proved nothing more than an encumbrance."

The percentage of parents present at the examination of their children was over 80, which may be regarded as a tribute to the personality of the medical officer. Dr. Rolleston makes some observations on the teaching of hygiene in the schools; on the whole he is satisfied with the effort made, but considers that hygienic teaching can scarcely be said to occupy any definite place in the course of instruction. He praises the valuable instructions given by the busy school nurse, and proposes to supplement the teaching by individual talks to each child examined.

INFECTIOUS DISEASE

IN ENGLAND AND WALES DURING THE WEEK ENDED JULY 11TH, 1931.

Notifications.—The following cases of infectious disease were notified during the week: Small-pox 45 (last week 56); scarlet fever, 1378; diphtheria, 892; enteric fever, 61; pneumonia, 618; puerperal fever, 39; puerperal pyrexia, 105; cerebro-spinal fever, 44; acute poliomyelitis, 6; encephalitis lethargica, 10; dysentery, 27; and ophthalmia neonatorum, 112. No case of cholera, plague, or typhus fever was notified during the week.

The number of cases in the Infectious Hospitals of the London County Council on July 14th–15th was as follows: Small-pox, 64 under treatment, 1 under observation (last week 97 and 1 respectively); scarlet fever, 1125; diphtheria, 1471; enteric fever, 18; measles, 143; whooping-cough, 448; puerperal fever, 39 (plus 12 babies); encephalitis lethargica, 206; poliomyelitis, 2; "other diseases," 133. At St. Margaret's Hospital there were 12 babies (plus 3 mothers) with ophthalmia neonatorum.

Deaths.—In the aggregate of great towns, including London, there were no deaths from small-pox, 2 (1) from enteric fever, 18 (0) from measles, 6 (1) from scarlet fever, 17 (3) from whooping-cough, 20 (2) from diphtheria, 35 (8) from diarrhœa and enteritis under two years, and 20 (3) from influenza. The figures in parentheses are those for London itself.

Three deaths from meningococcal meningitis were registered in London, one in an infant and the others in age groups from 25 to 45. There were two deaths from measles in Liverpool, Leeds, and Sunderland. Four fatal cases of diphtheria were reported from Leeds, three from Birmingham, and two each from Manchester and Salford. Diarrhœa and enteritis under two years caused three deaths in Sunderland, and two each in Stoke-on-Trent, Birmingham, Leeds, Sheffield, and Hull. Four deaths from influenza occurred in Birmingham.

The number of stillbirths notified during the week was 285 (corresponding to a rate of 41 per 1000 births), including 43 in London.

ANTS IN A HOSPITAL.—At a meeting of the Glasgow corporation recently complaints were made that there is a visitation of ants at Shieldhall fever hospital. It was stated that children's cots had been invaded, and the food in patients' lockers speedily became infested. The convenor of the public health committee explained that steps are being taken to deal with the ants, and that the creatures were harmless and "did not attack the patients."

EXTENSION OF ASHINGTON HOSPITAL.—On behalf of the Central Miners' Joint Welfare Committee, which made a grant of £10,000 towards the cost—£15,000—extensions of this hospital have been formally handed over. The enlargements comprise a new orthopædic department, an improved out-patients' department, a new theatre, and various accessories. During 1930 over 1000 patients were admitted, there were 22,000 out-patients, and more than 14,000 orthopædic cases were dealt with.

PARLIAMENTARY INTELLIGENCE

NOTES ON CURRENT TOPICS.

HOUSING IN RURAL AREAS.

THE House of Commons on July 16th considered the Housing (Rural Authorities) Bill on Report. On July 17th the third reading of the Bill was agreed to without a division.

BETHLEM HOSPITAL BILL.

On July 17th, in the House of Commons, Mr. Lansbury, First Commissioner of Works, moved the second reading of the Bethlem Hospital (Amendment) Bill, which has already passed through the House of Lords.

Mr. A. M. Samuel said he welcomed the Bill and the opposition would be glad to do all they could to facilitate its passing into law. It was due to a gracious and generous action and one that the House would approve.

Mr. Strauss said he could not help expressing regret that it had been found necessary to introduce the Bill to legalise the arrangement which had been come to with the donor of the park, the borough council, and the County Council. He did so because there was a very serious shortage of open spaces in that area, and those who were interested in the district were very jealous of every single acre of open space available. Under the force of necessity, almost, it had been agreed that a portion of the Bethlem Hospital site should be retained for the Imperial War Museum, but the people of Lambeth and Southwark would very much rather have an open space to play in than a war museum in their area.

Mr. Lansbury said that the Bill was going before a select committee because it was a private Bill and might affect private interests. He believed that some part of the present buildings would be destroyed. The fact was that there was no proper accommodation for the museum where it was at present. In reply to Mr. Strauss, he wished to say that they wanted every inch of land they could get for the children. They must live somewhere and they must be sheltered, and if they had pulled down the building entirely they would have had to put up a shelter for them.

The Bill was read the third time and committed to a select committee of five members.

The money resolution in connexion with the Bill was afterwards agreed to in committee.

STERILISATION OF MENTAL DEFECTIVES.

On July 21st, in the House of Commons, Major Church asked leave to introduce a Bill to enable mental defectives to undergo sterilising operations or sterilising treatment upon their own application, or that of their spouses, or parents or guardians. He said that those associated with him realised that in making this request for permission to introduce this Bill they were asking the House to do something which could be regarded as being in advance of public opinion. (Hear, hear.) They realised that they had got to convert a large section of the people to a full appreciation of the principles underlying the Bill. His opinion, although it was not that of all those associated with him in promoting this measure, was that this was merely a first step. It was a step in order that the community as a whole might be able to make an experiment on a small scale, so that later on the community would have the benefit of the results of the experience gained and be able to come to conclusions before compulsory sterilisation proposals for unfit persons were put forward.

The Bill was based on the willingness of those suffering from mental deficiency to undergo voluntarily an operation which would prevent them bringing children into the world. The Bill provided every reasonable safeguard for the voluntary principle. In the first place, the patients themselves must consent to the operation, or their spouses, or parents or guardians, must agree to the operation. In the third place there must be consent on the part of the Board of Control, and finally the operation could only be carried out after approval had been given by a judicial authority, such as a bench of magistrates. The operation would not be the mutilation usually associated with sterilisation. It was devised in order that the emotional life of the person operated upon should not be affected in the slightest degree, but that the patient should be effectively prevented from bringing children into the world. On the male there would be a very simple operation, which could be easily done in five minutes with a local anæsthetic, and there was no danger attached to it. Out of 5000 cases dealt with by the State of California there was only one death, and that was under the anæsthetic. In the case of women it was a rather more serious operation, but no more dangerous than an operation for appendicitis.

The Mental Deficiency Committee set up in 1925 and whose report was published in 1929, estimated that the certifiable mentally defective persons in the country numbered 300,000, of whom 25,000 were in institutions and another 50,000 were under the control of guardians. The committee had no recommendations for dealing with the remainder, but they recommended that institutions should be provided for one third of them—i.e., for 100,000 persons. That in itself was a tremendous drain upon the public purse and would tax the capacities of the local authorities for many years to come. But even if institutions were provided for 100,000, what was to be done with the other 200,000?

The headmaster of one of the schools for mental defectives had stated that they went out into the world at the age of 16, and that within two or three years 25 per cent. of them had been before magistrates' courts or children's courts in various parts of the Metropolis. He also stated that three or four years after leaving school many of these children had married and had had children, or had had children without being married. It might be urged that mere sterilisation was not enough and was not a cure for the problem of mental disease. He and those associated with him did not suggest that it was; but they suggested that since knowledge compiled as to the ancestry of mental defectives in a number of different states and countries showed that anything from 45 to 80 per cent. of the mental defectives had inherited defective germ plasm, it would be advisable to take the risk of sterilising the defectives, and that in the course of a generation or so their number could be reduced to measurable size. If the Bill was printed hon. Members would see that so far from attempting to violate the laws of morality all it proposed to do was something which large numbers of social workers, 53 of the borough councils in the country, whole masses of opinion in the medical and scientific professions, and many biologists believed to be the right course.

Dr. Morgan urged the House not to approve what he said was anti-working-class legislation. Nature had its own way of dealing with mental defectives—namely, by limiting their progeny. (Cries of "No.") They did not want nosey Parkers poking about, or to be influenced by eugenic nightmares. If what Major Church said was true what became of the great scientific doctrine of the survival of the fittest? There were two sources of mental defectives—those high up and those low down. It was well known that high-grade defectives had a high percentage of fertility. The cause of low-grade defectives was living under subnormal conditions nd being submerged in poverty. There were defective erm plasms in every family; and it was computed hat the chance of a defective paternal and maternal lasm uniting was one in five millions. The House hould reject this Bill and leave these poor people to e dealt with by the alternative method of segregation nd socialisation.

The motion for leave to introduce the Bill was jected by 167 votes to 89—majority 78.

HOUSE OF COMMONS.

WEDNESDAY, JULY 15TH.

Education of Mentally Defective Children.

Major **CHURCH** asked the President of the Board of ducation the total number of children under instruction schools for the mentally defective; whether any of these hools were non-provided; what proportion of the local ucation authorities provided special schools for mentally fective children; up to what age the attendance of the ildren admitted to such schools was compulsory; if atistics were available distinguishing between retarded ildren and children afflicted with known mental diseases; d if information was available with regard to the after-reers of those who had attended schools for the mentally fective.—Mr. **LEES-SMITH** replied: On 31st March, 1930, re were 15,500 children under instruction in special hools for the mentally defective. Nine of these schools e non-provided. Twenty-seven per cent. of the local thorities in England and Wales provide such special hools. Attendance is compulsory up to the age of 16. atistics are available showing the numbers of children tified as suitable for education in special schools for the ntally defective. These are children who suffer from a vere degree of retardation, or incomplete development the mind. There are no separate statistics in regard to ildren suffering from "known mental diseases," unless vere retardation itself is so regarded, but they are very few number and usually fall outside the scope of the educational stem. Records of after-careers are kept as far as possible the local education authorities and voluntary bodies ich maintain special schools.

Reception Hospitals for Mental Patients.

SORENSON asked the Minister of Health the number of on hospitals that now existed and that had been during the last 12 months in connexion with public al hospitals, and the total number of beds available in h cases.—Mr. **GREENWOOD** replied: Admission hospitals ve been provided or are under construction at about a arter of the public mental hospitals. Complete statistics n the other points raised in the question are not at present ailable, but I will make inquiry and communicate further ith my hon. friend.

New Serum for Puerperal Fever.

Mr. **RAMSBOTHAM** asked the Minister of Health if his attention had been called to the value of a new serum for preventing puerperal fever in the case of confinements; whether he intended to appoint a commission of inquiry; and whether any tests in this antitoxin had been made in the public institutions in this country and, if so, with what results.—Mr. **GREENWOOD** replied: I understand that the serum to which the hon. Member presumably refers has been and is being used for the treatment of patients in this country, but it is not yet possible to arrive at any definite conclusions as to its value. A considerable amount of research into the causes and treatment of puerperal fever is being undertaken, and is being carefully watched and assisted by the Medical Research Council and by my department. I do not consider, therefore, that there is any necessity for the appointment of a special commission of inquiry into this subject.

A Treatment for Tuberculosis.

Mr. **SMITHERS** asked the Minister of Health whether his attention had been directed to a treatment for tuberculosis called umckaloabo; and whether his department had examined it, and with what results.—Mr. **GREENWOOD** replied: The answer to the first part of the question is in the affirmative and to the second part in the negative. I am advised that the claims made in regard to this alleged form of treatment for tuberculosis do not appear to differ in character or degree from those made for many other so-called "remedies" which have been advertised from time to time and afterwards found to be valueless. I do not consider that there is sufficient ground for instituting a clinical investigation into its value.

Mr. **SMITHERS**: In view of the extraordinary success that is claimed for this treatment will not the right hon. gentleman at least ask his medical officer to look into it and report upon it?

Mr. **GREENWOOD**: Information in my department goes to show that the claim made cannot be sustained.

Lead Poisoning.

Mr. **GRAHAM WHITE** asked the Home Secretary the number of cases of lead poisoning notified during 1930 under the regulations of the Lead Paint Act and the number of cases which terminated fatally.—Mr. **CLYNES** replied: The number of cases notified during 1930 was 66. Thirteen of these cases terminated fatally.

Mr. **WHITE**: Is the right hon. gentleman satisfied that these regulations are working satisfactorily?

Mr. **CLYNES**: I have no reason to doubt that on the whole they are, but I shall be glad to receive information of particular instances where they are not.

MONDAY, JULY 20TH.

Mentally Defective Children.

Mr. **GORDON MACDONALD** asked the Minister of Health the number of mentally defective children in certified institutions in England and Wales at the latest date for which the information was available, and for each of the five years ended March 31st, 1931, giving separate figures for Lancashire.—Miss **SUSAN LAWRENCE** replied: The following are the figures asked for. The total number of mental defectives in certified institutions in Lancashire and in England and Wales respectively during the last five years was as follows:—

On Jan. 1st.	In Lancashire	In England and Wales.
1926	3,581	12,766
1927	3,627	13,342
1928	3,712	14,099
1929	3,770	14,810
1930	3,858	15,664
1931	3,919	17,200

It is regretted that separate statistics for children are not available, but it is estimated that of the total numbers given above approximately 15 per cent. are children under 16 years of age.

TUESDAY, JULY 21ST.

O.T.C. Camps and Cerebro-spinal Meningitis.

Miss **PICTON-TURBERVILL** asked the Secretary of State for War whether the annual camps of the Junior Division of the Officers' Training Corps were being cancelled this year, and if so, for what reason.—Mr. **T. SHAW** replied: Owing to the continued incidence of cerebro-spinal meningitis throughout the country it is considered inadvisable to collect boys of a susceptible age in camps in large numbers. Boys who would have attended camp but for the cancellation will, for purposes of "efficiency," be deemed to have attended.

Meningitis in the Army.

Mr. **MARJORIBANKS** asked the Secretary of State for War the number of cases of deaths from meningitis in the British Army stationed at Home during each of the last three years.—Mr. **T. SHAW** replied: The number of deaths from cerebro-spinal meningitis in the British Army at Home during the years 1928, 1929, and 1930 was 2, 9, and 10 respectively.

WOLVERHAMPTON HOSPITAL CONTRIBUTORY SCHEME.—A contributory scheme for Wolverhampton Royal Hospital is under consideration. The scheme provides for membership under the following scale: Limit of income £200 a year, or £4 a week, applicable to single persons over 16 years of age, and widows or widowers without children under 14 years of age; limit of income £250 a year, or £5 a week, applicable to married couples without children under 14 years of age, and persons with one dependant under 14 years of age; limit of income £300 a year, or £6 a week, applicable to married couples with a child or children under 14 years of age, and persons with more than one dependant under 14 years of age. The scale of contributions under the scheme is: For persons between 14 and 16, 1*d*. a week; persons between 16 and 21 and females over 21, 2*d*. a week; for others, 3*d*. a week. In the latter cases, the wife, or dependant, or children up to 14 years of age, would be eligible for hospital benefit.

OBITUARY

FRANCIS RICHARDSON CROSS, M.B.Lond., F.R.C.S.Eng., LL.D.

Mr. Richardson Cross, of Bristol, whose death on July 12th we announced last week, was held in high esteem as an ophthalmic surgeon. His practice and his reputation extended far beyond the West of England, and he was long regarded as one of the leading men of his specialty.

The son of Joseph Cross, vicar of Merriott, in Somerset, F. R. Cross was born there 83 years ago, and was educated at Crewkerne Grammar School. Thence he went as scholar to King's College, London, and qualified as M.R.C.S. in 1871. The next seven years were variously and usefully employed in clinical and academic appointments. He was house surgeon at King's College Hospital and resident medical officer at St. Pancras Dispensary; he was evening lecturer in physiology, assistant demonstrator in anatomy, medical tutor, and sub-dean at King's College. Though he attended the Royal London Ophthalmic Hospital as clinical assistant, it was as lecturer on anatomy that he went back to the Bristol Medical School, and it was as a general surgeon that he joined the staff of the Bristol Royal Infirmary in 1878. Elected full surgeon in 1879, he carried on general work for six years, and then resigned to take up the new post of hon. ophthalmic surgeon. Here he managed his department with ability and served the Infirmary well, both professionally and as an organiser. Although he left the active staff in 1900, he continued his association with the hospital, and became vice-president in 1919. He also did a great deal for the Bristol Eye Hospital, where he was surgeon for a long period, and for the Royal School for the Blind. At the same time, through his connexion with Bristol Medical School, he played an important part in the foundation of Bristol University. He was lecturer and subsequently reader in ophthalmology, and fittingly received the honorary degree of LL.D. He was also elected a Fellow of King's College, London.

MR. RICHARDSON CROSS.

[*Photograph by Lafayette.*

From an early stage in his career Mr. Cross was a notable contributor to the journals of his specialty, and sound work soon earned him a distinguished place among his colleagues. He was elected a member of the Council of the Royal College of Surgeons of England in 1898, and served in this capacity until 1914, when he took office as president of the Ophthalmological Society of the United Kingdom. He delivered the annual oration of the Medical Society of London in 1901, the Bradshaw lecture of the College of Surgeons in 1909, the Long Fox lecture at Bristol in 1915, and the Doyne lecture at Oxford in 1920. In his relations with societies and their members, as in his practice and social life, he was as happy in manner as in intention. As a surgeon, perhaps he owed his success not so much to his own original work as to his ability to assimilate what was sound and useful in the practice of others. He was tall and finely built, with a charming voice, and his patients instinctively knew that he was a kindly man. He inspired them also with confidence. This and a shrewd judgment enabled him to get done what was required in serious ca and to ensure that his directions were carried out.

A man of sound common sense, Cross was elected to a large number of the more important pub offices in the city of Bristol. He was Sheriff of Bristol in 1897, and was formerly president of the Grateful Society and the Dolphin Society, and a member of the Council of Clifton College. A ke sportsman, he long followed the Duke of Beaufor hounds, and latterly took much interest in the breeding of stock.

Mr. Cross married in 1889 Eva, daughter of Capt Hawkes, R.N. She died in 1920, and they le three daughters.

MEDICAL NEWS

University of Oxford.

On July 19th the following degrees were conferr

M.Ch.—T. H. Sellors and B.G. Scholefield.

B.M.—G. H. Bateman, F. Bicknell, H. de B. Kempt R. B. Scott, T. R. Plummer, H. S. Atkinson, R. D. Newt R. R. Bomford, Elizabeth C. M. Brunyate, Olive M. Capp Johnson, and (Mrs.) Winifred Pitkin.

University of Cambridge.

Mr. David Keilin, Sc.D., F.R.S., at present universi lecturer in parasitology, has been elected to the Qui professorship of biology, for three years, in succession to Dr. G. H. F. Nuttall, F.R.S., who retires on Oct. 31st Dr. Nuttall has held the professorship since 1906 when it was founded. It is laid down that the professor sha devote himself to the study of parasitology.

Royal Faculty of Physicians and Surgeons of Glasgow.

At the meeting of the Faculty on June 1st the following were admitted to the fellowship: Amar Chand Bhardwa (Simla), John Aloysius McCann (Liverpool), and William Patrick (Glasgow).

University of London.

At a meeting of the Senate on July 15th, Mr. Cyril Lodowic Burt, D.Sc., was appointed to a university chair of psychology tenable at University College.

The Rogers prize of £100 was awarded to Dr. R. W. Fairbrother.

At recent examinations the following candidates were successful:—

DIPLOMA IN PSYCHOLOGY.

Hilda Bristol, Rachel M. Creed, Annie M. Gibson, Margaret A. Leiper, Annie D. Paterson, Doris F. Robinson, Jugal Singh, Jeannette B. Shaw, and Diana V. Spearman.

DIPLOMA IN BACTERIOLOGY.

Dora C. Colebrook, Catherine B. Hendry, C. O. Karunakaran, A. R. Martin, *A. E. Oxford, F. W. Priestley, W. D. B. Read, George Robinson, and Pauline C. Witherow.

* Awarded a Mark of Distinction.

nlversity of Durham.

At recent examinations the following candidates were ccessful :—

M.D.—C. F. Fairlie, George McCoull, L. F. O'Shaughnessy *t absentia)*, T. S. Severs, G. E. Stephenson, H. G. Ungley, H. Wear, and J. H. Weir.

M.D. for Practitioners of 15 years' standing.—J. W. Irvine.

M.B., B.S.—Hugh Bannerman, W. C. D. Bewick, Robert wley, J. I. M. Black, T. H. Boon, Gladys M. Brice, J. L. Burn, F. Down, W. P. Dunn, W. L. Gardner, J. W. Gibson, John les, T. R. Harlan, H. F. Harvey, N. V. Hepple, A. R. Holtby, D. Kelly, J. J. H. Lowe, Elizabeth S. Malcolm, Eileen G. rshall, J. A. McKeon, J. C. Moor, E. W. Peet, A. H. Penman, de W. Ranken, L. R. Routledge, Cathleen Rowstron, Edward ith, and H. K. Vernon.

B.Hy. and D.P.H.—Bertram Sergeant.

L.D.S.—J. A. Atkinson and A. D. Hitchin.

niversity of Liverpool.

The following awards have been made :—Lady Jones search Fellowship in Orthopædic Surgery : E. N. Wardle, B. John Rankin Fellowship in Anatomy : G. W. Causey, B. Johnston Colonial Fellowship in Biochemistry : W. Brookfield, M.D. John W. Garrett International llowship in Bacteriology : Honora J. Twomey, M.B. l Fellowship in Pathology : D. H. Collins, M.B. Holt llowship in Physiology : C. L. G. Pratt, M.D. Thelwall omas Fellowship in Surgical Pathology : R. A. Furniss, B. Robert Gee Fellowship in Human Anatomy : T. E. bnon, M.B. Samuels Memorial Scholarship (Medicine) : A. Birch, M.D. Samuels Memorial Scholarship (Surgery) : Silverstone, M.B. Dr. N. E. Roberts Prize (Zymotic eases) : S. Alstead, M.D. Owen T. Williams Prize : L. Hughes, M.B.

iversity of Leeds.

r. William Gough, F.R.C.S., has been elected professor ynæcology, and Mr. Andrew Moynihan Claye, F.R.C.S., essor of obstetrics in the university.

rse on Circulatory Disorders.

Post-graduate Course on Diseases of the Heart and els will be held at the Hôpital Broussais, 96, rue Didot, s, XIVe, from Oct. 5th to 17th; under the direction r. C. Laubry. Particulars may be had from Dr. Matton e hospital.

s Beatrice Hospital.

Kensington, Fulham, and Chelsea General Hospital en renamed the Princess Beatrice Hospital.

Bartholomew's Hospital and College.

The old students' annual dinner is to be held on Thursday, . 1st, in the Great Hall of the hospital at 7 for 7.30 P.M. Percival Hartley will preside.

e late Dr. C. A. Porter.

Dr. Charles Allen Porter, emeritus professor of surgery Harvard University, whose death is reported from ston, will be remembered in this country as the surgeon charge of the hospital unit which Harvard presented to eat Britain and sent over to France in 1915. He came of distinguished family which has given medical practitioners New England since 1625.

ternational Union against Tuberculosis.

The annual meeting of the council of this union, whose airman is Prof. Frölich (Norway), was held in Paris on uly 9th and was attended by delegates from 17 countries. t was decided that the next conference of the union should e held at the Hague from Sept. 6th to 9th, 1932, and hat the three following subjects should be inscribed on the genda : The Relationship between Allergy and Immunity ; old-therapy ; and After-care Schemes for the Tuberculous. The scientific session was held at the Pasteur Institute, in e new tuberculosis laboratories which the members of the ouncil visited under the guidance of Prof. Calmette. The meeting was devoted to the report of Dr. Soper (United tates) on A Standard Antituberculosis Plan ; in Dr. oper's absence his report was read by Prof. Opie. Prof. altis (Greece) explained the steps taken in regard to the ntituberculosis campaign in his country. These reports were followed by a discussion in which Prof. Léon Bernard, Secretary-General of the Union, Prof. Knud Faber (Denmark), Colonel Rudzki (Poland), and others took part. On the same evening the members of the council dined at the Indo-Chinese pavilion in the Colonial Exhibition, where they were the guests of the French national committee for the campaign against tuberculosis. M. Blaisot, Minister of Public Health, gave an address of welcome.

Fellowship of Medicine and Post-Graduate Medical Association.

From August 4th until the end of the month a course in urology will be held at the All Saints' Hospital. It will include demonstrations and cystoscopies, and will occupy the afternoons and some evenings. The Queen's Hospital for Children is giving an all-day course from August 17th to 29th, instruction being entirely by demonstration of cases. During September courses will be given at the Brompton Hospital (from Sept. 7th for one week), the Bethlem Royal Hospital (Sept. 8th to Oct. 3rd), the Infants Hospital (Sept. 14th to 26th), the Central London Ophthalmic Hospital (Sept. 14th to Oct. 10th), the Westminster Hospital (Sept. 14th to 26th), and the Metropolitan General Hospital (Sept. 28th to Oct. 10th). Detailed syllabuses may be had from the Fellowship of Medicine, at 1, Wimpole-street, London, W. 1.

THE SERVICES

ROYAL NAVAL MEDICAL SERVICE.

THE following appointments have been made: Surg. Lts. R. A. Graff to *Vivid* for Plymouth Hospital; J. H. Nicolson to *Erebus;* and C. R. Boland to *Effingham.*

ROYAL NAVAL VOLUNTEER RESERVE.

Surg. Lts. E. E. Henderson and F. A. McLaughlin to be Surg. Lt.-Comdrs.

Proby. Surg. Lt. W. B. Wilson to be Surg. Lt.

ROYAL ARMY MEDICAL CORPS.

Maj. J. W. Houston retires on retd. pay on account of ill-health.

Maj. (prov.) G. E. MacAlevey from the secd. list, is restd. to the estabt.

Lt. E. H. Hall to be Capt. and remains secd.

Lt. P. V. MacGarry to be Capt.

The undermentioned Lts. (on prob.) from the secd. list are restd. to the estabt.: J. T. Robinson and J. M. Gibbon.

ARMY DENTAL CORPS.

Lt. R. W. Mather to be Capt.

TERRITORIAL ARMY.

F. R. Langmaid (late Offr. Cadet Serjt., Univ. of Lond. Contgt., Sen. Div., O.T.C.) to be Lt. with seniority.

John O'Donnell to be Lt.

INDIAN MEDICAL SERVICE.

Lt. (on prob.) D. C. Chopra to be Capt (prov.) (on prob.).

Lt.-Col. J. Anderson retires.

ROYAL AIR FORCE.

O. M. Fraser is granted a short service commission as a Flying Officer for three years on the Active List.

RESERVE OF AIR FORCE OFFICERS.

Flight Lt. T. M. Walker is employed with the Regular Air Force for a further year.

The *London Gazette* announces the appointment of Surg. Vice-Admiral R. St. G. S. Bond, C.B., as an Honorary Physician to The King as from July 1st.

Medical Diary

Information to be included in this column should reach us in proper form on Tuesday, and cannot appear if it reaches us later than the first post on Wednesday morning.

LECTURES, ADDRESSES, DEMONSTRATIONS, &c.

FELLOWSHIP OF MEDICINE AND POST-GRADUATE MEDICAL ASSOCIATION, 1, Wimpole-street, W.

MONDAY, July 27th, to SATURDAY, August 1st.—MILLER GENERAL HOSPITAL, Greenwich-road, S.E.10. Intensive course in general medicine and surgery. Second week. Daily 10.30 A.M., to 5.30 P.M., demonstrations, lectures, operations.—Further particulars from the Fellowship of Medicine.

WEST LONDON HOSPITAL POST-GRADUATE COLLEGE, Hammersmith, W.

MONDAY, July 27th.—10 A.M., Genito-Urinary Operations, Skin Department. 11 A.M., Surgical Ward Visit. 2 P.M., Surgical Ward Visit, Medical, Surgical, Eye, Gynæcological Out-patients.

TUESDAY.—9.30 A.M., Operations. 10 A.M., Medical Ward Visit, Dental Department. 11 A.M., Throat Operations.

11.30 A.M., Surgical Clinical Demonstrations. 2 P.M., Medical, Surgical, Throat, Out-patients, Operations, Medical Ward Visit.

WEDNESDAY.—10 A.M., Medical Ward Visit, Children's Medical Out-patients. 2 P.M., Medical, Surgical, and Eye Out-patients. Gynæcological Operations. 4.45 P.M., Venereal Diseases.

THURSDAY.—10 A.M., Neurological Department. 11.30 A.M., Treatment of Fractures. 2 P.M., Medical, Surgical, and Eye Out-patients. Genito-Urinary Department. Operations.

FRIDAY.—10 A.M., Medical Ward Visit, Skin and Dental Departments. 12 noon, Medical Lecture. 2 P.M., Medical, Surgical, and Throat Out-patients. Operations.

SATURDAY.—9 A.M., Throat Operations. 10 A.M., Medical Ward Visit, Surgical and Children's Medical Out-patients.

CHARING CROSS HOSPITAL MEDICAL SCHOOL POST-GRADUATE COURSE.

SUNDAY, July 26th.—10.45 A.M., Mr. C. Jennings Marshall: Hæmaturia: Its Significance and Investigation. 11.45 A.M., Dr. A. A. W. Petrie: Adolescent Psychoses.

ST. MARK'S HOSPITAL, City-road, E.C.

THURSDAY, July 30th.—4.30 P.M., Mr. W. B. Gabriel: Anal Fissure.

Appointments

FREEMAN, ERNEST A., M.B., B.S. Lond., F.R.C.S. Eng., has been appointed Fracture Officer and Orthopædic Surgeon to the Royal Hospital, Wolverhampton.

MITCHELL, J. G., M.B., Ch.B., N.Z., Certifying Surgeon under the Factory and Workshop Acts for Hednesford, Stafford.

MONCRIEFF, ALAN. M.D. Lond., M.R.C.P. Lond., Honorary Physician for Diseases of Children to Bolingbroke Hospital, Wandsworth.

SIMPSON, A. S., M.B., B.S. Lond., Medical Officer of Health for Stalybridge.

STOTT, W., M.B., B.S. Durh., Medical Officer of Health for Southwark.

Vacancies

For further information refer to the advertisement columns.

Aberdeen Royal Infirmary.—Jun. Asst. Surgeon.
Accrington, Victoria Hospital.—H.S. £150.
Acton Hospital, W.—Jun. Res. M.O. £100.
All Saints' Hospital for Genito-Urinary Diseases, Finchley-road, N.W.—H.S. At rate of £150.
Altrincham General Hospital.—Sen. and Jun. H.S. At rate of £150 and £100 respectively.
Bangor, Carnarvonshire and Anglesey Infirmary.—H.S. £200.
Barnsley, Beckett Hospital and Dispensary.—H.P. £200.
Bath, Royal United Hospital.—Sen. H.S. At rate of £175.
Bedford County Hospital.—Asst. H.S. At rate of £130.
Benenden, Kent, National Sanatorium.—Res. Asst. M.O. £300.
Birmingham, Midland Hospital, Easy-row.—H.S. £150.
Bootle General Hospital, Nr. Liverpool.—H.P. At rate of £150.
Bradford Children's Hospital.—H.P. £120.
Bradford Royal Infirmary.—Three H.S.'s. Each £150.
Bury Infirmary, Lancs.—3rd H.S. At rate of £150.
Brighton, Royal Sussex County Hospital.—Cas. H.S. £120.
Brighton, Sussex Eye Hospital.—Hon. Clin. Asst.
Bristol, Stoke Park Colony.—M.O. £600.
Chester, East Lancashire Tuberculosis Colony, Barrowmore Hall, Great Barrow.—Asst. M.O. At rate of £275.
Chesterfield and North Derbyshire, Royal Hospital.—H.S. At rate of £150.
City of London Hospital for Diseases of the Heart and Lungs, Victoria Park, E.—H.P. At rate of £100. Also Registrar.
Coventry, Coventry and Warwickshire Hospital.—Res. Cas. O. £125.
Dudley, Guest Hospital.—H.S. and Asst. H.S. £200 and £170, respectively.
Durham County Hospital.—Two H.S.'s. Each £150.
East Ham, County Borough of.—Asst. M.O. £500.
Exeter, Royal Devon and Exeter Hospital.—H.P. and H.S. to Special Depts. Each at rate of £150.
Folkestone, Royal Victoria Hospital.—Locum Tenens Res. H.S.
Gravesend and North Kent Hospital.—Jun. H.S. £100–£150.
Great Yarmouth General Hospital.—H.S. £140.
Halifax, St. Luke's Hospital.—H.S. At rate of £250.
Hertford County Hospital.—H.P. At rate of £150.
Holland (Lincs.) County Council.—Asst. M.O.H. £500.
Hove, Lady Chichester Hospital.—Jun. H.P. At rate of £50.
Huddersfield Royal Infirmary.—H.S. At rate of £150.
Hull Royal Infirmary.—H.S. to Sutton Branch. £160.
Ipswich, East Suffolk and Ipswich Hospital.—Cas. O. £120.
Kent Education Committee.—Temporary School Medical Inspector. 12 guineas per week.
King Edward Memorial Hospital, Ealing.—Res. M.O. £150.
Leeds Hospital for Women.—H.S. At rate of £100.
Liverpool Eye and Ear Infirmary, Myrtle-street.—H.S. to Ophth. Dept. £120.
Liverpool, Royal Children's Hospital.—Two Res. H.S.'s. Each at rate of £500.
Liverpool, Smithdown-road Hospital.—Med. Supt. £1000. Also Deputy Med. Supt. £500.
London University, S.W.—University Readership in Pathology. £800.
Lurgan Union, Northern Ireland.—M.O. £300.
Macclesfield, Cheshire County Mental Hospital, Parkside.—Asst. M.O. £350.
Manchester, Ancoats Hospital.—Res. M.O., £150. Also H.P., H.S., and Orthopædic H.S. All at rate of £100.
Manchester Babies Hospital.—Jun. Res. M.O. At rate of £1
Manchester, Manchester and Salford Hospital for Skin Diseases.—H.S. At rate of £100.
Manchester, Northern Hospital for Women and Children.—Sen. H.S. and Jun. H.S. £130 and £100 respectively.
Manchester Royal Eye Hospital.—Jun. H.S. £120.
Manchester Victoria Memorial Jewish Hospital, Cheetham.—Jun. H.S. At rate of £125.
Margate Royal Sea Bathing Hospital for Surgical Tuberculosis.—H.S. At rate of £200.
Marseilles, Queen Alexandra Memorial Hospital.—Res. M.O. £250.
Middlesex Hospital, W.—Sen. and Jun. Res. Asst. Anæsthet At rate of £120 and £80 respectively.
Newcastle-upon-Tyne, Newcastle General Hospital.—Two H.P.'s and three H.S.'s. All at rate of £150.
Northwood, Mount Vernon Hospital.—H.S. At rate of £15
Plymouth Mental Hospital, Blackadon.—Deputy Med. S £500.
Poole, Dorset, Cornelia and East Dorset Hospital—H.S. At of £150.
Queen Mary's Hospital for the East End, E.—Hon. Ophth. S
Pontefract General Infirmary.—R.M.O. £200–£300.
Reading, Royal Berkshire Hospital.—Res. Anæsthetist. rate of £150.
Rotherham Hospital.—Cas. H.S. £150. Also H.P. £180.
St. Leonards-on-Sea, Buchanan Hospital.—Jun. H.S. £12
Salisbury General Infirmary.—H.P. £150.
Sheffield, Children's Hospital.—Whole-time Med. Regist Pathologist. £350.
Sheffield, Jessop Hospital for Women.—Asst. H.S. At rate £100.
Sheffield Royal Hospital.—Cas. O. and Res. Anæsthetist. rate of £150 and £80, respectively. Also Ophth. H.S.
Sheffield Royal Infirmary.—H.S. and Second Asst. Cas. O. Ophth. H.S. Each at rate of £80.
Staffordshire, Longton Hospital.—H.S. £120.
Swindon and North Wilts Victoria Hospital.—Res. M.O. rate of £125.
Walsall General Hospital.—H.P. At rate of £150.
Walsall Manor Hospital.—Asst. M.O. £150.
Warrington Infirmary and Dispensary.—Jun. H.S. £175.
Wolverhampton, New Cross Hospital.—Asst. Res. M.O.
Worcester General Infirmary.—Jun. H.S. £120.

The Chief Inspector of Factories announces vacancie Certifying Factory Surgeons at Egremont (Cumb and at Hillsborough (Sheffield).

Births, Marriages, and Deat

BIRTHS.

DAVIES—On July 18th, at 27, Welbeck-street, the wife Dr. Daniel T. Davies, of a son.

MARRIAGES.

BATT—ROBERTS.—On July 14th, at the Parish Ch Cadoxton, Barry, Dr. John Child Batt, to Mona Edw Roberts, of Cadoxton, Barry.

ECKHOFF—ALLISON.—On July 17th, at Christ Church, Lanca gate, Nils Lovold Eckhoff, M.S., F.R.C.S., to Audrey daughter of the late Mr. T. J. Allison, of Pietermaritzb Natal.

DUNCAN—BUNTING.—On July 18th, at St. John's, Stanm F. W. Kenneth Duncan, L.D.S. Eng., to Florence Lill only daughter of Mrs. Bunting and the late Walter Samp Bunting, of Westgate-on-Sea.

HEATH—FEATHER.—On July 14th, at St. Mary's Church Weaverham, Cheshire, William Edwin Heath, M.B., B.S. to Winifred Maude Feather, M.B., Ch.B.

PRESTON—KING.—On July 21st, at All Saints', Upper Norwood Thomas Warwick Preston, M.D., M.R.C.P., to Marga Mary King.

YOUNG—BALL.—On July 18th, 1931, at St. James', Norlands Dr. George Campbell Young, younger son of the late Mr. John Young and Mrs. Young, of Wimbledon, to Minni Marjorie, youngest daughter of Mr. and Mrs. Ball, of Chesterfield.

DEATHS.

GRAY.—On July 15th, at Loughor, suddenly, Allan Edward Lambton Gray, M.B., C.M. Edin. of Abbotsea, Leamington Spa, aged 66 years.

ROSE.—On July 18th, at a nursing home in Barnet, Captain Percy Rose, L.R.C.P., D.P.H., late R.A.M.C.

TATE.—On July 18th, at The White House, Louth, Lincolnshire, after brief illness, Lieut.-Colonel R. G. H. Tate, R.A.M.C. retired, aged 52.

N.B.—A fee of 7s. 6d. is charged for the insertion of Notices of Births, Marriages and Deaths.

NOTES, COMMENTS, AND ABSTRACTS

MENTAL INEFFICIENCY AND ADOLESCENT CRIME.

By W. Norwood East, M.D., M.R.C.P. Lond.,
ONE OF H.M. COMMISSIONERS OF PRISONS.

(*Concluded from p. 169.*)

The Psychopathic Type.

The constitutional psychic inferiors usually present n prison reactions markedly different from those of he group of psychopathic personalities with whom hey are classified by some observers. Healy,[11] ollowing Adolf Meyer, adopts the term "constitu-ional inferior" rather than "psychopathic inferior," nd places cases of constitutional psychic inferiority etween feeble-mindedness and insanity. I have lready stated that this condition appears to me to e between mental deficiency and normality; and ses of psychopathic personality, as we see them prison, seem to me to occupy a position between nsoundness of mind and normality. I suggest, in ther words, that the qualities of the constitutional ychic inferior which affect criminal conduct are gative, and those of the psychopathic personality e positive.

Ziehen [12] includes in his definition of psychopathic rsonalities a very wide range of cases, embracing, May points out, not only hysteria and neurasthenia t epilepsy. Clouston [13] recognised the group, and luded therein the crank, the markedly eccentric, l the anarchist; the man who easily falls into minal ways; the miser, the chronic drunkard, e asocial and the ne'er-do-well; and the man of rbid wayward impulses possessing much originality much force of character. Kraepelin [14] divides group into several classes: the excitable, the ble, the impulsive, the eccentric, the asocial, hers.

American *Psychiatric Association Committee* cribes psychopathic personalities as a large group pathological personalities whose abnormality is pressed mainly in the character and intensity of heir emotional and volitional reactions. It specifi-ally excludes feeble-minded individuals, and calls tention to the fact that the constitutional psychoses ise on a basis of psychopathic inferiority or con-itution, because the previous mental make-up in hese conditions shows more or less clearly abnor-nalities in the emotional and volitional spheres. here remain, however, other less well-differentiated ypes of psychopathic personalities, and in these the sychotic reactions differ from those in the preceding roups. It is these less well-differentiated types of motional and volitional deviation which are to be esignated, at least for statistical purposes, as sychopathic personalities. The type of behaviour isorder, the social reactions, and the trends of interest, which psychopathic personalities may show give special features to many cases—e.g., criminal traits, moral deficiency, tramp life, sexual perversions, and various temperamental peculiarities. The Com-mittee further point out that the mental disturbances or psychoses which develop in psychopathic personali-ties are varied in their clinical form, and are usually sporadic in character. Most frequent are attacks of irritability, excitement, depression, paranoid episodes, and transient confused states, and the Committee place the prison psychoses in this group.

Dr. August Wimmer,[15] in a personal letter, describes the group as follows:—

"A psychopath or constitutionally psychopathic person is an individual, the social maladjustment or antisocial or criminal trends of whom are due not to real defects of intelligence (as in feeble-mindedness), but to an anomalous mode of emotional and instinctive reaction and to behaviour troubles resulting therefrom. His psychic anomalies are habitual, very often manifesting themselves from early childhood, and mostly due to hereditary influences. His abnormal psychic outfit is rather constant during his lifetime, even if showing some fluctuation in connection with, for instance, menstruation, puberty, climacterium, and it is only to a certain degree influenced by environmental conditions—e.g., social, educational, and prison life. Along with the psychic troubles are often found other biological or nervous disturbances, manifesting the organic substratum of the psychopathy—e.g., developmental irregularities, retardation of physiological ripening, troubles of sleep, and convulsive conditions, more or less hysteriform or revealing the aspect of affect epilepsy or the like. Very often the psychopaths will more episodically, or in a more phasic way, manifest isolated or more psychotic symptoms as syndromes—psychogenic psychosis."

Prof. Wimmer adds that he considers a long definition necessary to avoid confusing the cases with mild stages of real mental disease.

The psychopathic personality may be associated with grave crimes or petty offences, and mental abnormality may be suggested by the circumstances of the antisocial act. These offenders are often characterised in prison by forceful, hostile, stubborn, violent, and reckless conduct; and they sometimes exhibit transient phases of excitement or depression. We see them often irritable, quarrelsome, impulsive, suspicious, untruthful, vain, and conceited; they may be impervious to argument and difficult of approach. Their reactions are persistently opposed, and in some particular direction, to the organisation of their environment; they may repeat the same crime in an attempt to impose their will on others, and their conduct is frequently detrimental to their own welfare. They sometimes swallow foreign bodies and refuse food, they make frivolous complaints, and exaggerate subjective sensations. Their outlook is selfish and narrow, they lack insight into their condition, and their judgment is biased. But they are shrewd, cunning, alert, energetic, and capable, and their memory, attention, perception, and capacity for sustained effort may be good. This type of offender is frequently under observation in prison, and may develop mild persecutory ideas or insane delusions. It is characteristic of the condition that the delusions tend to disappear when the individual is at liberty, and to reappear after reconviction.

The diagnosis of this cause of mental inefficiency may be conjectural in adolescent offenders, but the passing years display the symptoms of the fully declared condition.

A lad, 19 years of age, was convicted of warehouse-breaking in association with a man some years older than himself. His history showed that he was sent to live with his grandmother when two years old, and was accompanied by two elder brothers. At the age of 14 he unwillingly returned to his parents, and twice stole from his father the exact railway fare back to his grandmother. He was detained for four years in a reformatory, where he was happy and conducted himself well. On discharge he returned home and obtained several occupations which he soon left, and he was thought to be lazy. He was not solitary; he played cricket, football, and billiards, and owned a motor cycle. His home was a good one, but his parents frequently quarrelled. On examination I found him alert, independent, and rather brusque in manner. He was of fair average intelligence and his memory, attention, and perception were good. He professed great affection for his grandmother, and less for his mother. He was definitely hostile to his father; he considered that it was wrong to send him from home when so young, and also wrong to send him to his parents after he left school. He believed his father was prejudiced against him, as he reported the thefts to the police, and would not let him remain out late at night, although his brother, aged 25, was allowed to do so. He was affronted because his father allowed his sister to read harmless books, but tore up the detective stories he brought home. His outlook on life was somewhat defiant; he was obstinate, jealous, and suspicious, and entertained ideas of persecution. His initiative and energy were directed towards crime as a result of his social maladjustment. The inability to deal with his emotional conflicts in a satisfactory manner, and the resulting paranoidal reactions, suggested a constitutional psychopathic make-up. It remains with the future to declare whether the efforts to divert him from crime will meet with success, or whether he will continue prejudiced and inefficient, a slave to the tyranny of his organisation.

The Psychoses.

The authorities quoted and actual prison experience show that manic-depressive disorder may arise in psychopathic personalities as well as in individuals who, after the normal emotional level has been regained, present no mental peculiarity other than the tendency to recurrence of the cyclothymic reaction. In criminal cases, as elsewhere, it is important to distinguish between the two types of case, for the psychopathic personality remains at a constant disadvantage and may commit further offences as a result, although rid of the manic-depressive episode.

In adolescents the milder phases of mental excitement or depression, seen so frequently in delinquents, may suggest adolescent instability rather than cyclothymic disorder. But, broadly speaking, the emotional phase in the latter is one either of exaltation or depression, and is more or less continuous for the time being, and the resulting conduct is compatible with the current emotional state. In adolescent instability the emotional reactions are mixed, and are unaccompanied by the continuous press of activity of the hypomanic patient or the continuous diminution of psychomotor response of the hypomelancholic. And although, in the early stages of mania, emotional hyper-excitability is liable to rapid and successive changes, the accumulation of symptoms as the disorder proceeds soon demonstrates its severity and distinguishes it from the less intensive condition of adolescent instability. The mildest degrees of mental exaltation and depression are not infrequent causes of temporary mental inefficiency in adolescents, and may be worsened if corrective efforts are misdirected or misapplied. If the slight cyclothymic deviations from ordinary conduct are recognised and appraised, the criminal adolescent can be assisted to regain his normal mental level and efficiency.

In the severe forms of schizoid reaction the cause of the mental inefficiency is so obvious that it is unnecessary for us to consider the cases at length. But we see in certain criminal adolescents inefficiency arising from mental symptoms, minor in degree, but of the præcox type. The subjects show slight loss of interest in their environment, they may be idle at work and disinclined for games, they may have an ill-defined sense of inferiority, be somewhat unsociable and preoccupied, and appear incapable of sustained effort. Some are inclined to be suspicious, hesitating, and hostile to authority and control. In others, slight vagaries of thought, feeling, and action may present themselves from time to time; trivial happenings may excite disproportionate reactions and whimsical conduct result from passing fancies. But the individual symptoms are only slight exaggerations of those usually associated with adolescence, and only call for a legitimate extension of the latitude and toleration usually permitted to youth. They indicate collectively only a slight departure from a state of adequate adjustment.

Some of these cases can be observed to progress, and present later the clinical features of dementia præcox. Some remain unchanged, although under observation for prolonged periods. The symptoms may resemble, for a time, those seen in certain cases of high-grade feeble-mindedness, particularly defectives who are developing the præcox syndrome. But not a few re-establish their social contacts and regain and apparently maintain their mental health, and it seems proper to regard them as examples of the minor and recoverable grades of dementia præcox to which Mapother,[16] Henderson and Gillespie,[17] Devine,[18] and others have directed attention. Recovery may be aided by patient, prudent, and sympathetic encouragement, by obtaining the subject's coöperation to readjust his difficulties, and by attention to his general health. It is important also to remember that Beaton,[19] in discussing the treatment of early cases of dementia præcox, warns us that "it is unwise in these acute adolescent disturbances to permit of any systematic psychological investigation; analysis in the Freudian sense has, in the experience of most psychiatrists, been productive of more harm than good, and it is certainly unnecessary."

Hysteria and Anxiety.

The symptoms usually presented by the hysteric delinquent before trial are mutisms, fugues, amnesias, and fits. But sometimes the psychic inefficiency is shown by emotional explosions, or the imitation of some striking anti-social act which has received undue publicity. These morbid mental phenomena permit the individual to assert himself, and arouse the interest and compassion of his audience. They are obtruded and outlined in a manner the hysteric believes to be accurate and recognisable; and, although they become exaggerated in a sympathetic environment, there is no conscious attempt to deceive and no conscious motive for the symptoms. They are the solution of his mental conflict, and express his incompetency to deal with unfavourable circumstances.

After trial the hysterical exhibitions of convicted prisoners are perhaps more frequently physical than mental. Occasional examples of the latter are seen in delinquent girls who shut themselves in their rooms and set them on fire, or insert needles in their breasts and limbs. We meet them again in male offenders, youths, and occasionally men, who swallow foreign bodies. In many of these cases we can trace ment conflict, and the suggestibility of the offender is show by the frequency with which he copies the misdirecte efforts of an associate. Further, the calm ment attitude described by Janet in cases of hysteria often present; and although the subjects are clea anxious to assert themselves, and desire to a interest and invoke sympathy, they reject the prob consequences of their self-inflicted injuries. Evide of the hysterical nature of the symptoms recei additional support from the fact that they pa when the environment is changed. I have alr called attention to the fact that many offenders who swallow foreign bodies are psychopathic personalities. Vanity prompts others to attempt to secure the admiration of their fellows by these means. Some who require repeated abdominal sections to remove a succession of foreign bodies are reckless criminals, prepared to go to any length to cheat justice and gain their ends. It is not so long ago that their prototypes placed their limbs under railway trucks to avoid work, or shattered a finger to escape oakum-picking.[20]

Mild anxiety states may be the cause of abnormal fatigability of obscure origin in adolescent offenders. The natural disinclination of youths to admit fear, and their inability to appreciate the limitations imposed by anxiety, often make it particularly difficult to elucidate the symptoms associated with their social inefficiency. The prison physician must go out to meet the patient, who is unlikely to refer to his difficulties spontaneously. But seldom are cause and effect so clear as in the following case:—

A youth was convicted for breaking into a pavilion, and had been previously convicted for theft. He left one situation for no apparent reason, although he was earning 65s. a week at the time. He appeared to be depressed, reserved, diffident, and lacking in self-confidence. He wandered from home, slept out, and was the despair of his parents, who were unable to understand his eccentricities until he confided his troubles to them by letter, being too shy to speak openly about them. He was in good physical health, but it was clear that he had been anxious about his bodily condition for a long time, and thought that an imaginary bodily deformity and his habit of blushing made him conspicuous and ridiculous to strangers in the street. The mere thought of appearing in public produced a panic which was met by a phobia so overwhelming that he could only go out when it was dark, or during the day if enveloped in a large macintosh.

And, although he was able to attend a week-end camp by means of this expedient, he was unable to stir out of his tent. He described how he repeatedly went to his own front door to start to look for work, and was then overcome with panic and returned, although his mother sometimes went to the door with him to encourage him to greater efforts. He was a good worker, and believed that if he had obtained night-work he would have been able to retain it. But, as things were, he looked forward to detention in prison or a Borstal Institution as the best solution of his difficulties. He was of average intelligence and his memory was fair, but he was encumbered by a sense of his own inferiority, was easily fatigued and unable to concentrate, and his sleep was disturbed. His facial expression was anxious and depressed, and reflected clearly his emotional state. He had some insight into his condition. He underwent a course of psychotherapy and regained confidence in himself, and the anxiety and depression appeared to pass off. But when last heard of there was reason to suppose that the symptoms had returned.

The compulsion neuroses need be mentioned only to be dismissed. They are readily distinguished from the impulsive actions of defectives and from other causes of mental inefficiency if their paroxysmal characters and accompaniments of resistance and distress are called to mind. Some psycho-therapeutists admit that these cases are among the most intractable in the whole range of psychotherapy.

Fatigability.

There is perhaps no single condition so frequently associated with mental inefficiency and adolescent crime as a disinclination for work due to indolence and fatigability. Fatigability may be a symptom of mental deficiency, but in some juvenile offenders indolence appears to be an independent and innate constitutional disposition, probably comparable to the indolence of certain primitive races whose wants are few and easily satisfied. It is exhibited in others as a habit of mind which has been acquired as the result of precept, example, or circumstance. G. H. [illegible][21] has pointed out how wrong-placement, inadequate training, and an unsympathetic supervisor tend to dull enthusiasm so that work and everything associated with it has, in time, so many accumulated associations of harshness, discomfort, and inadequate that it is shunned. Indolence results in the postponing the commencement of his task as long as possible, and leaves him unexhausted when the work is completed. He expends a minimum of energy, and if the matter in hand is unfinished he is unconcerned, as he is unable to appreciate the satisfaction of accomplishment. Nevertheless, he often succeeds at play, for he may undertake this with enthusiasm and energy. He sleeps well and is not necessarily irritable, although he often displays temper when forced to work.

Mental fatigability, which I suggest is to be distinguished from indolence, may be associated with various conditions: with physical disease, endocrine imbalance, sexual and other excesses, mental deficiency and mental disorder, and psychological reactions to conscious difficulties or repressed conflicts. It is of recent development in the life of the patient and, although it may restrict his capacity for work, is not inconsistent with ambition. Moreover, failure causes disappointment, if the subject is concerned with results and covets fulfilment. Unlike the indolent adolescent, he tires at play as quickly as at work, for his energy is soon exhausted. Moreover, he often sleeps badly, and may be irritable generally.

William Brown,[22] writing in 1926, leads us to consider that reliable results have been obtained by skilful hands in the measurement of mental fatigue. But William McDougall,[23] writing in the same year, insists that the results of experimental studies of fatigue, up to date, are meagre, chiefly because the energy of the human organism is conditioned by the physiological state at the time of the experiment, and because the varying factors of incentives and motives are beyond control. C. S. Myers [24] has directed attention to the fact that the ergogram is favourably influenced by increased interest, pleasure, or other mental excitement. Laboratory tests, therefore, seem inadequate materially to assist the clinician to arrive at the ætiological factors which lower the threshold of fatigue. This is unfortunate, for the distinction between indolence and abnormal fatigability is important when dealing with adolescent delinquents. Here, as elsewhere, the detection of initial causes and their removal, when possible, is the first step in treatment. Then follows, for the indolent, incentive, example and reward; for the fatigued, suggestion, encouragement, and graduated progress; for both, the presentation, at the opportune moment, of the fact that purposive striving is a problem which must be faced before social efficiency can be attained. Probably no harder task is imposed upon the guardians of adolescent criminals than the conversion of firmly established indolence into efficiency if the subject is also slightly below the average in mental capacity, but above the level of mental deficiency. The following is an example:—

A youth, 17½ years old, was charged with vagrancy. He had been previously bound over for shopbreaking in company with another lad, and occasionally slept out. His father was dead, his mother was a respectable, hard-working charwoman. He was thought to be dull at school, but on leaving went as little-piecer in a mill and remained at the same employment for 15 months, in spite of the fact that the work was distasteful and the placement at fault. He did no regular work after this, except during four months in one situation, although permanent employment was offered him. The police did not consider his tendencies were criminal, although he was an idle frequenter of street corners. His general health was good, his height was 66 in., and his weight, 132 lb., was normal for his age and height. He was below the average in intelligence, and his mental age was 11 years. But he was fairly well-informed on matters of ordinary interest and common knowledge, although his performance tests, judgment of shapes, memory for designs, mechanical ability, and manual dexterity were probably below the average for his class. He lacked ambition and perseverance, and complacently confessed to being lazy. His aim in life seemed to be to get as much excitement out of it with as little effort as possible. But none of the experienced medical men through whose hands he passed found sufficient evidence to support a certificate of mental deficiency.

Adolescence is the age of surprises, and various factors combine to produce mental inefficiency and crime. I have endeavoured throughout to keep in close contact with clinical problems, and this is essential to the nature of our work. For our material is elusive: inferiority may be associated with crime or genius, the same conscious difficulties may produce opposite effects in different individuals, repression may be associated with criminal conduct, but without repression coöperative power is lost and society as we know it is impossible. Moreover, the problems are complex: psychiatry and psychology throw much light upon them, but other methods of approach are important also, notably the sociological, biological, anthropological, and eugenic. We must not confuse a part with the whole. Mental deficiency is an important factor in producing mental inefficiency, and we should resist any attempt to make it the dumping-ground for all adolescent non-effectives. It is for us to recognise slight deviations from normal conduct and endeavour to set them right. To do this we must ascertain as far as possible their origin and probable causes and effects. Some of our cases, like the unstable adolescents, may be guided safely through this difficult period. Some, like certain psychopathic personalities, may remain irresponsive. Some, like the mild cyclothymes, may reach the phase of normal conduct unassisted. All provide material for study and research. In our dealings with adolescent criminals, as well as in our own affairs, we must remember McDougall's admonition: "The really difficult thing in life is to have the stoicism that comes with realisation of the vanity of human wishes, and to combine it with energetic purposes and keen zest in the striving to accomplish them: to look at yourself and your affairs in a large and humorous way, and yet be urged on to constant effort by the divine discontent; to be at once stoic, epicurean, and keen worker. Yet, unless you can be all these together, you will not have made the most of life."[25]

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MEDICAL EDUCATION IN THE SUDAN.

THE Kitchener School of Medicine, Khartoum, has just issued its third report, covering work done in the years 1928–1930. It was founded in 1924 with the object of building up a cadre of Sudanese doctors to combat the epidemic and endemic disease of their country, to bring medical assistance within reach of all the inhabitants, and ultimately to replace medical men imported from abroad. The course takes four years, followed by a year at one of the larger hospitals in a house appointment; the abbreviation is secured by compressing the teaching of anatomy and physiology into a single year and omitting from it everything not definitely essential to the subsequent instruction. The school works on a small scale, and individual attention can be given that almost amounts to personal tuition. The yearly output aimed at is six qualified men, and the first-year class is maintained at ten students, carefully selected from the Gordon College. Seven doctors graduated in 1928 and seven more in 1929; all of these are now medical officers, and six are in sole charge of small hospitals, performing entirely satisfactory work. Five more have graduated this year, and are still on probation in house appointments. The success of these pioneers has made a great impression on students at the Gordon College, and there should now be no difficulty in getting recruits from the best type. The establishment of chemistry and biology classes at the Gordon College has enabled a more thorough grounding in these subjects to be given during the first year, and close liaison between the two bodies has been established in many directions. The new medical research laboratories, established opposite the school in 1928, have facilitated the teaching of pathology and now work in close coöperation with the school and the Civil Hospital. The experiment is interesting, for the students belong to a primitive people which little more than a generation ago was sunk in barbarism and misery. They are, however, virile, teachable, and capable of great enthusiasm and devotion. A country is more influenced by its medical profession than perhaps by any other movement, and the school ought to play an important part in the development of the Sudan.

TOBACCO TOLERANCE IN FISH.

Léon Binet and C. Zamfir record[1] experiments made on fresh-water fish in order to determine whether tolerance to tobacco and nicotine could be established. The tobacco was administered in the form of a maceration fluid made by soaking 2 g. of Maryland tobacco in a litre of river water for 24 hours, stirring occasionally, and finally filtering. The experiments were carried out in vessels containing 600 c.cm. of river water to which the fluid had been added in varying proportions. Three goldfish were prepared by exposure to water to which was added maceration fluid in gradually increasing strength, from 7·5 per cent. to 22·5 per cent. in 51 days. The fish were alternately exposed for 24 hours and rested for 24 hours in a large tank of running water. After this preparation they survived exposure to concentrations which killed unprepared fish in an hour, and after 66 days' preparation they even survived exposure to undiluted maceration fluid for three-quarters of an hour. Similar results were obtained with solutions of nicotine up to 0·003 c.cm. of the pure alkaloid in a litre of water. As, however, no investigation was made into the possible after-effects of the experience, smokers should not be too ready to draw the conclusion that tobacco in any quantity is harmless once a tolerance is established.

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[1] Bull. et mém. Soc. méd. hôp. de Paris, June 22nd, p 1106

A PATIENT'S VIEWS ON TUBERCULOSIS.

A BOOK[1] *written by a layman* who has himself had tuberculosis, and feels that much of his suffering might have been spared if he had been dealt with frankly by his doctors in the earlier stages, is worth attention. The writer is an American, and the book i essentially American in its outlook. The autho evidently had an unfortunate beginning to hi experience as a phthisical patient. In the introduction, he says that, although he consulted and wa examined by a number of physicians, none of the ever seemed to appreciate the sinister nature of th disease, and none of them ever gave him a parti of helpful advice. He has, therefore, set out t produce a book "by a layman, for laymen, and wi the layman's point of view," in the hope that it ma bring about a better understanding of the disease an its problems in the mind of the patient.

The book is a good comprehensive survey of th tuberculosis problem from the patient's standpoi It is written in a crisp, arresting style, and contai much good advice. The medical profession con for a good deal of candid criticism—for exam "Much harm is constantly being done by i criminate and ill-advised surgery, or surgery th undertaken too soon. There is a time to operat *a time not to operate*, and it requires experien with the disease to make the proper decision."

The author writes feelingly about so-called cure "The disease lends itself well to every kind of 'cure and remedy under the sun, providing there is plen of rest mixed up with it. After one becomes tuber cular, it seems that half of the people one meets kno *of a certain remedy or form of treatment* that the claim 'cured' some relative of theirs or someone the knew."

On the question of sunlight, real or artificial, the author expresses the sound view that it should never be used except upon the advice and under the supervision of experienced physicians and technicians. He has good advice to give to his fellow-countrymen on the choice of places to live in, such as Colorado, California, and the Pacific Northwest. The final chapter contains some helpful remarks to ex-patients on occupation, especially to those who have been compelled by their disease to change their job.

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[1] *Tuberculosis: its Cause, Prevention, and Care.* By Frank H. Livingston. New York: The Macmillan Company. 1930. Pp. 191. 10*s.* 6*d.*

STANMORE OBELISK.—The Royal National Orthopædic Hospital's branch at Stanmore, Middlesex, stands upon part of the ground where in 54 B.C. the most powerful British tribe, the Catuvellauni, under Cassivellaunus, checked the Roman advance on S. Albans. About the year 1760 a local resident erected an obelisk to commemorate the victory and placed Latin inscriptions upon it. The obelisk, which had fallen into bad condition, has just been restored by the committee of the hospital and the inscriptions replaced.

ADDRESSES AND ORIGINAL ARTICLES

ON VACCINE THERAPY AND IMMUNISATION IN VITRO.*

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THE methods of combating infections in the organism can be divided up into (*a*) those which aim at removing or extirpating the microbes by mechanical means; (*b*) those which aim at killing the microbes by the agency of chemical antiseptics; (*c*) those which make use of the antibacterial powers which already exist in the organism, but do not concern themselves with increasing these; and (*d*) those which aim at developing increased bactericidal powers in the blood or passively supplementing these powers.

It will be useful to preface what I have to say about vaccine therapy by a brief survey of the alternative methods of treatment.

Methods of *surgical extirpation* may be distinguished into incomplete operations which confine themselves to the removal of a conspicuous focus of infection, and those which aim at the complete eradication of an infection combined with an excision of a *locus minoris resistentiæ*.

Operations of the former kind were only a few years ago extensively employed in surgical tubercle. They were resorted to upon the idea that the organism would, when the full weight of the infection had been taken off, be competent to cope with the germs that are bound to be left behind. This optimism was, of course, more often than not disappointed, the operation being frequently followed by a recrudescence of the infection. This, in point of fact, is just what might have been expected. For operations upon infected foci must always carry with them a risk of producing a negative phase of diminished antibacterial power and favouring the spread of the infection.

Similar dangers attach to enucleation operations of the kind which leave open raw surfaces. Here, if the resistance of the organism is reduced, reinfection from outside is likely to follow.

Treatment by Antiseptics.

The history of antiseptic treatment is the history of what has followed from the erroneous assumption that chemical agents which kill microbes when brought into application in water will do the same when brought into application in serum-impregnated tissues, suppurative discharges, and blood. The ordinary medical man deems that assumption to be somehow right, and he fails to see any reason why it should not be. And he feels sure that if the assumptions he made were wrong, clinical observation would very quickly bring this out.

That confidence is quite misplaced. Probative evidence of the harmfulness of a treatment is furnished only when the clinical condition of a patient becomes conspicuously worse after the application of a treatment, and this happens again and again. Similarly probative evidence of the efficacy of a treatment is furnished only when the clinical condition of a patient is indubitably better after treatment, and this happens repeatedly. In every other case clinical observation leaves us in incertitude as to whether a method of treatment is doing a modicum of good, or a modicum of harm, or is doing neither good nor harm.

Once these inherent limitations of clinical methods are realised it becomes obvious that we must, if medicine is to make steady advance, find some method of distinguishing treatment which is in an inconspicuous manner useful; from treatment which is in an inconspicuous manner harmful; and from treatment which does neither harm nor good.

The first thing to lay to heart here is that it is hopeless to trust in such matters to our unaided senses, and that it is in the case of antiseptics fallacious to draw inferences from the clinical condition of the patient or the condition of a wound. If we seriously want to arrive at the therapeutics of a bacterial infection we must do two things.

First, we must experiment upon simpler biological complexes—complexes such as the blood or the pus or inflammatory fluids derived from a focus of infection, or, better still, upon separated blood fluids, transudation fluids, and leucocytes.

Secondly, we must, in order to discover the event of a therapeutic intervention, have recourse to laboratory technique and scientific apparatus.

Let me give a concrete illustration of the kind of therapeutic problem which I have here in view.

As an incident in an enterprise of research undertaken in 1911, with the aim of alleviating the formidable mortality from pneumonia in the mines of the Transvaal, I and my fellow-workers had, *inter alia*, to inquire into the utility of the internal administration of antiseptics, a method of treatment which was in vogue in some of the mine hospitals.

We had here to elect between two procedures—statistical inquiry into the results of treatment being one method; and inquiry into the effect exerted by antiseptics upon the pneumococcus suspended in serum being the other.

Let us consider what the former method of inquiry would have involved. It would have involved, first, obtaining control over the treatment in the mine hospitals. It would have involved choosing one particular antiseptic and one hard and fast scheme of dosage for all the cases, and imposing this upon all the medical officers. It would have involved further the carrying out of the experiments upon a very large number of cases, and arranging for a corresponding number of similar cases to be left untreated. It would have involved also the keeping of medical histories of all the cases and the verification of the diagnoses by post-mortem examinations of all who died.

Again, and this is a very important consideration in connexion with statistical inquiries into any treatment which is believed in by some observers and dissented from by others (and that was the case here), there is in all such cases a very strong presumption that the treatment in question is in reality not very effective, and that the figures when they shall have been arrived at will exhibit a difference too small to be convincing.

Finally, if the aforementioned considerations do not clearly bar the method of statistical inquiry, one has to consider the length of time and the formidable number of patients which would be required for settling by statistics even a single item in a programme of treatment—for example, the superiority of one antiseptic over another, or of one scheme of dosage over another.

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* Based on an address to the Medical Society of London on Oct. 27th, 1930.

From all this it is apparent that the method of statistical inquiry is utterly impracticable, and that it would, if this were the only method available to us, be necessary to abandon all hope of determining whether a particular treatment is in some degree helpful; or in some measure harmful; or leaves things just as they are. There remains, however, the alternative of recourse to laboratory experimentation.

ON THE APPRAISEMENT OF THE VALUE OF ANTISEPTICS BY LABORATORY METHODS.

The earliest, or among the earliest, experiments on the question as to whether antiseptics can be turned to account in the treatment of bacterial infections, would appear to have been those of Koch. It was shown by him that though sublimate in a dilution of 1 in 1,000,000 inhibited the growth of anthrax in nutrient gelatin, sublimate in double that concentration does not in any way modify the course of anthrax infection in rabbits. Behring showed that this found its explanation in the fact that a dilution of 1 in 10,000 of sublimate was required to restrain the growth of anthrax in serum. And calculation shows that to achieve such a 1 in 10,000 concentration of sublimate in the blood fluids of a 70-kilo man it would (assuming these fluids to measure 2500 c.cm., and assuming also the full quantum of sublimate administered to come into application) be necessary to administer intravenously 0·25 g. of sublimate —i.e., about grs. 4.

Our experiments were carried out in essentially the same way as those of Behring. Graduated dilutions of antiseptics were made in water, on the one hand, and serum on the other, and then in each case the same quantum of pneumococcus culture was implanted. The details of these experiments are set out in my book entitled The Treatment of Pneumonia by Drugs and Vaccines (Constable, London, 1914). The upshot was that while lysol, creosote, and guaiacol—the three antiseptics experimented with—kill the pneumococcus in very high dilutions in water they would, for killing the pneumococcus in the patient's blood, have to be administered intravenously in frankly poisonous doses—in the case of lysol in a dose of over 75 minims and in the case of both creosote and guaiacol in a dose of 15 minims.

We now come to some further points in connexion with the testing the efficacy of antiseptics by *in vitro* experimentation. In particular, it must be realised that while the method of measuring of the bactericidal power of an antiseptic upon microbes implanted into serum is infinitely superior to the method of measuring the bactericidal power upon microbes suspended in water, it is, nevertheless, a method which fails to take into regard many very important physiological considerations.

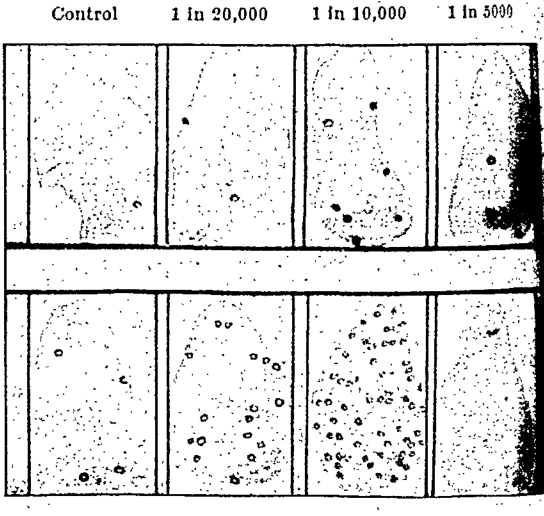
My friend and fellow-worker, Prof. A. Fleming,[1] has very properly insisted that antiseptics which are destined for use in the blood should be tested upon microbes implanted into blood; and similarly, that antiseptics designed for use in a wound should be tested upon microbes contained in or implanted into pus.

Fleming further pointed out that antiseptics may be usefully tested by implanting staphylococcus into serum without and with antiseptics and incubating measured quanta of such sera in capillary tubes lined with emigrated leucocytes and, for purposes of control, also in ordinary unlined capillary tubes.

The apparatus and technique employed in these testings having been elsewhere described,[2] I may deal directly with their results. And those experimental results can be most conveniently shown in the form of diagrammatic pictures.

Fig. 1 shows the effect of adding in slide cells an ordinary antiseptic to blood implanted with staphylococci. Infinitely more can be learned from an experiment of this kind than was learned from experiments in which microbes are implanted into serum. The experiments which I made by that method in South Africa taught us only that creosote, guaiacol, and lysol and such antiseptics do not kill microbes immersed in serum. From these of Fleming we learn that antiseptics added to blood in small doses render the blood more congenial to microbic growth, and that they, when added in the largest doses that could be used therapeutically, convert the blood into a medium in which serophytic microbes grow unrestrained. (These results are due to the antiseptic entering into destructive chemical combination with the leucocytes.) Finally we learn here, as in experiments such as those we made in Africa, that bactericidal effects are achieved only where frankly poisonous doses are resorted to.

FIG. 1.



Carbolic Acid. Effect on staphylococci in blood. Equal volumes (25 c.mm.) of infected blood and dilution of antiseptic. 25 c.mm. of blood plated on agar gave 56 colonies.

Exactly the same lessons are taught by Fleming's marvellously simple and ingenious experiments with pus. In Fig. 2 it is seen that a non-corrupted pus taken from a wound and kept from drying (by placing it on a moist agar surface under a cover-glass) possesses not only sufficient, but (as other experiments show) more bactericidal power than is needed to kill such numbers of microbes as are ordinarily contained in it. And the figure shows that when half per cent. carbolic acid is added to such pus its bactericidal power is forfeited—this being, as in the case of the carbolised blood, due to a poisoning of the leucocytes.

Fig. 3 again enforces the same lesson. Here carbolised and non-carbolised sera are implanted in each case with staphylococcus. In Fig. 3 A where the staphylo-implanted serum has been cultivated in tubes lined with emigrated leucocytes we see that the umber of colonies which develop increases as more ind more carbolic acid is added—this result being as n the other experiments attributable to a poisoning of he leucocytes by the antiseptic.

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[1] Proc. Roy. Soc. B., 1924, xcvi., 171.

[2] Most of it in my "Technique of the Teat and Capillary Tube," second edition, Constable, London, 1921.

In *Fig. 3* B *where precisely the same sera are culti*-ated in unlined capillary tubes we see that the umber of microbes which grow out into colonies is he same in all the tubes. In other words, carbolic cid in strengths up to 1 in 400 fails to nhibit the growth of staphylococcus n serum.

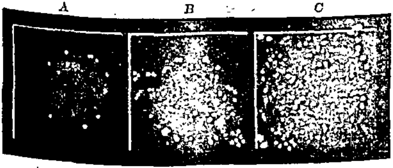
Chemotherapeutic Agents or Endohæmic Antiseptics.

Having taken these things to heart, e may now pass to the consideraon of the antiseptics which Ehrlich yled—I venture to think very unfornately—*chemotherapeutic agents*. wo things about that designation trike me as unfortunate. The prime bjection to the term is that it does ot make clear that Ehrlich meant by chemotherapeutic drug: an agent hich would enter into destructive emical combination with microbes the organism. The second objection the term is that every active drug d vaccine has an indefeasible claim be called a chemotherapeutic agent. view of this I would propose to ll the drugs Ehrlich called chemoerapeutic agents *endoseric*, or *endohæmic, antiseptics*, and to call the dinary antiseptics, for distinction, *ectoseric*."

OPTOCHIN.

With this I resume the account of experiments made in South Africa 11. After finding that medicinal ta of lysol, creosote, and guaiacol ere incompetent to kill pneumococci blood, I proceeded to make trial optochin—a quinine derivative hich had, in the hands of Morgenoth, given very striking results in he treatment of mice infected with highly virulent pneumococcus. Morgenroth's results pointing, as it seemed to me, to ptochin being an endoseric antiseptic—I commenced perations by adding it in graduated doses to serum mplanted with pneumococci. These experiments howed that optochin exerted a bactericidal effect upon pneumococci in serum, and that it exerted this effect in serum and in water indifferently in all dilutions up to 1 in 400,000.

FIG. 2.



(A) A drop of wholesome uncorrupted pus obtained from a wound was here implanted upon an agar plate and incubated under a cover-glass. Here all the microbes were killed excepting a few which have grown out into colonies in the film of fluid pressed out from the pus by the weight of the cover-glass.

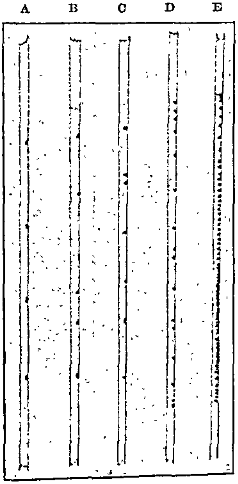
(B) A similar drop of pus which had been heated to 47° C.

(C) A similar drop of pus which had received an addition of 1 in 300 carbolic immediately before it was imposed upon the agar plate.

Similar experiments showed that optochin exerts *this bactericidal effect specifically upon the pneumo*coccus. Ordinary ectoseric antiseptics exert their effect upon microbes without distinction of kind.

We further found that the serum of animals and man was bactericidal for the pneumococcus for at least five hours after the ingestion of optochin.

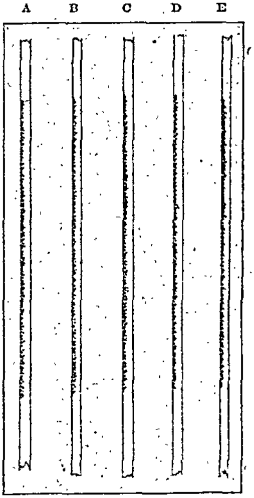
FIG. 3A.



Leucocyte-lined capillary tubes filled in in each case with serum containing the same charge of staphylococcus and in the case of (B) (C) (D) and (E) an addition of carbolic acid.

(A) Serum with no carbolic.
(B) ,, ,, 1 in 3200 carbolic.
(C) ,, ,, 1 in 1600 ,,
(D) ,, ,, 1 in 800 ,,
(E) ,, ,, 1 in 400 ,,

FIG. 3B.



Unlined capillary tubes filled in in each case with the same charge of staphylococcus and in the case of tubes (B) (C) (D) and (E) an addition of carbolic acid.

(A) Serum with no carbolic.
(B) ,, ,, 1 in 3200 carbolic.
(C) ,, ,, 1 in 1600 ,,
(D) ,, ,, 1 in 800 ,,
(E) ,, ,, 1 in 400 ,,

These findings were confirmed by Schiemann[3] in 1915. *His experiments* showed that the pneumococcus implanted into citrated blood was killed by optochin employed in dilutions as high as 1 in 1,000,000.

There are not sufficient clinical data for deciding definitely upon the value of optochin in the treatment of human pneumonia *for, owing to the drug affecting* the patient's eyesight, experimentation with it had everywhere to be broken off. The therapeutic effect would, however, appear to have been, taken generally, disappointing.

SALVARSAN.

Let me now deal with another chemotherapeutic agent, to wit, salvarsan, and its application to the treatment of anthrax, streptococcus, and staphylococcus infections.

With regard to the anthrax bacillus, the experiments of Schiemann showed that salvarsan exerts in dilutions such as can be obtained in the blood by the exhibition of a *dosis tolerata* a bactericidal effect upon this microbe. His experiments further showed that it takes with such high dilutions a number of hours to effect the destruction of the anthrax bacillus.

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[3] Zeits. f. Immun. Orig., 1915, xxiv., 167.

The history of the idea that salvarsan might exert a bactericidal action upon the streptococcus in the body is as follows: That salvarsan might possibly exert a bactericidal effect not only upon the spirochætes of syphilis which were Ehrlich's special target, but also upon the associated streptococcal and staphylococcal infections suggested itself to me in treating cases of rupia with one of the earliest samples of 606. What specially impressed me was the almost magical disappearance of the streptococci from the sequence of cultures made from the lesions of patients under treatment. To test the possibility of this being due to a bactericidal action exerted directly upon the streptococcus I proceeded next to administer 606 to a case of malignant endocarditis. That case, like other cases, ended fatally, but the results were so far favourable that for a time the patient's temperature regularly came down after each injection of 606.

Later on the question as to whether the blood fluids become, after the injection of 606, bactericidal to the staphylococcus, was investigated and answered in the affirmative by experiments made by two of my fellow-workers, S. R. Douglas and L. Colebrook.[4]

Later researches made by Colebrook[5] in connexion with the bactericidal effect exerted upon the streptococcus brought out the following facts:—

(1) The variety of streptococcus which is most sensitive to the bactericidal action of salvarsan is the *Streptococcus hæmolyticus.* The others are much less sensitive to the drug administered in medicinal doses.

(2) The blood is, by the intravenous injection of salvarsan, rendered more bactericidal to the *Streptococcus hæmolyticus.* The same result is obtained by adding the drug in similar concentration to the blood in vitro.

These results do not, as was pointed out by Colebrook, mean that salvarsan is not poisonous to leucocytes. It means only that the drug, when employed in medicinal concentrations, is less poisonous to the leucocytes than it is to the streptococcus.

A further important finding which concerns these results must now be noted. Colebrook—like Schiemann, in working with anthrax—found that salvarsan when employed in medicinal doses in serum kills streptococcus only after operating upon them for three hours. Now this means, of course, that salvarsan must, if it is to do any good, continue to circulate in the blood in adequate concentration for that minimum number of hours. Convincing *in vitro* proof that it does so must always be difficult to obtain. What requires in this connexion to be borne in mind is that if a sample of blood drawn off and tested after intravenous injection contains arsenic in effective quantities, that is not in itself conclusive. For the arsenic content in a blood sample which is tested in vitro continues unchanged while the arsenic in the circulating blood may be in steady decline.

It follows from the fact that data with regard to the amount of arsenic in the blood and the rate of elimination in the blood are with difficulty accessible that the utility of salvarsan in the treatment of bacterial infections must in the last instance be determined by clinical experiment.

Favourable results have been reported from the use of the drug in anthrax, and this furnishes ground for hope that success may be obtained also in the treatment of streptococcal infections; and further ground for hope is furnished by the fact that Colebrook, by a course of [illegible] eous inoculations of arsenicals, has been able to keep the strepto-bactericidal power of the blood at a high level for several weeks.

Conclusions Relating to Chemotherapy.

Let me now try to summarise the outcome of this, I am afraid, long-drawn discussion. Two things in particular have come out clearly:—

(1) The first is that a bactericidal and sterilising action in the organism can be looked for only from drugs which can be used in concentrations which exert a bactericidal action in the serum and blood in vitro, and it is futile to expect any advantage from the exhibition of drugs which abolish the bactericidal action of leucocytes.

(2) It is likewise futile to expect a bactericidal and sterilising effect in the organism from the exhibition of such endohæmic antiseptics as are both slow in action and vanish very quickly from the circulation.

In obedience to these principles we must cross of the list of intravitam endohæmic antiseptics, no only all the ordinary familiar antiseptics, but also large number of drugs which are or have been reput chemotherapeutic agents.

We must cross off to begin with *sanocrysin* whic was, in despite of the fact that it fails to kill th tubercle bacillus when used in a 1 in 500 concentratio in serum, bruited abroad as a chemotherapeu remedy for the treatment of tuberculosis. We m further, despite the fact that *optochin* kills the pneum coccus in the blood in very high dilutions, cross off our list for the reason that it is gravely poisono Further, we must cross off *mercurochrome,* for th drug added to serum and blood in the highest conce trations which would be permissible in the organis fails to exert a bactericidal effect.[7] We must furth cross off from the list of chemotherapeutic agent *flavine* and *gentian violet,* for these dyestuffs, thoug they are both endohæmic antiseptics, are eminent slow in their action, and vanish very quickly from t circulation.

If we question ourselves what remains of the che therapy of bacterial diseases proper when all the ab items have been crossed out, our answer must be apparently only salvarsan and its congeners rem We have seen with regard to these that they increase the bactericidal power of the blood to anthrax bacillus and the *Streptococcus hæmolytic* and that they may perhaps remain in the circulati in sufficient concentration long enough.

This general conclusion is very important when w ask ourselves exactly how much can be done by methods other than vaccine therapy in the treatment of bacterial infections.

Kataphylaxis.

Before I pass on to consider what can be done by vaccine therapy it will be well perhaps to gauge what can be done by other procedures which aim at killing microbes by what I have ventured to call *kataphylactic* measures, that is measures which determine to the focus of infection the bactericidal powers resident in the blood fluids and leucocytes. Examples of what I have called kataphylactic measures are the opening up of abscesses, the evacuation of infected discharges, the application of Bier's bandages and of hot compresses, all kinds of radio- and helio-therapy, and the drawing out of corrupted serum from an infected surface by the agency of hypertonic salt solution. These methods are in every case of service. But when all is said and done the degree to which they are useful in the particular case depends upon the antibacterial potency of the blood—this being the reservoir of antibacterial power which every kataphylactic measure draws upon. This may be illustrated by the fact that the opening up of a localised tuberculous focus when the bactericidal power of the blood is below par does very little towards extirpating the infection while such a measure is more effective when the antituberculous power of the blood is well above par.

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[4] [illegible], 1916, i., 181.

[5] Med. [illegible] Spec. Rep. Series, 119.

[6] Brit. Jour. Exp. Path., 1926, vii., 174.

[7] Unpublished Experiments of Colebrook and Fleming.

Principles of Vaccine Therapy.

I pass now to the subject matter proper of this discussion—the employment of vaccines for the purpose of enhancing the antibacterial power of the blood in infected patients.

Let me—for it is axiomatic that every therapeutic measure should repose upon a sound theoretical basis—begin what I have to say about vaccine therapy by harking back to its intellectual foundations, and *justifying principles*. The principle of vaccine therapy is the same as that of Pasteur's antirabic inoculations. Pasteur gave intellectual countenance to his antirabic inoculations by pointing out that a man who has been bitten by a rabid animal may in the interval between the implantation of the virus and the development of overt symptoms be quite properly classed as uninfected, and that he may consequently, with propriety, be preventively inoculated.

That was the principle to which I gave extended application by pointing out that all localised infections may be conceived of as precursors (generally, of course, abortive precursors) of septicæmic infections. And the way I pictured the situation to myself was that, so long as an infection remains localised, the infected tissues combat the infection unaided, the uninfected tissues remaining in the meanwhile passive and idle. Picturing things to myself in that way led *inevitably to the thought* that it would be possible by the aid of vaccines "to turn to account the interest of the infected tissues the unexploited immunising faculties of the uninfected tissues."

In formulating that principle I had in view under the denomination of "tissues," the "fixed tissues." I meant, so far as I meant anything precisely, the subcutaneous tissues into which the vaccine was inoculated and the various cellular organs with which the vaccine would, after absorption, come into contact. I would now propose to replace the term tissues in the above formula by the term leucocytes. That proposed change of wording is dictated by the consideration that conclusive evidence (some of this I *propose* to adduce) has been *obtained* of the elaboration of antibacterial substances by leucocytes, while we have, despite every sort of search, failed to find any indication of the generation of antibodies by the fixed tissues.

With that I pass to another point. When *it is* claimed for therapeutic procedure that it will enhance the antibacterial power of the blood, that contention should in every case—I need hardly say how very rarely this is even attempted—be confirmed by evidence obtained by laboratory methods. To comply in the case of vaccine therapy with this requirement it was necessary to devise new methods of blood testing. This was necessary because the method of testing the bactericidal power of the serum which I had devised for use in connexion with antityphoid inoculation is inapplicable where we are dealing with serophytic microbes, such as the staphylococcus and streptococcus.

The Opsonic Index.

It was to meet this new requirement my late friend and fellow-worker, W. B. Leishman, devised his method for measuring the phagocytic power of the blood. And the method for measuring the opsonic power of the serum, which was an outcome of Leishman's method, was also devised in the service of vaccine therapy.

Without these methods it would, except only in cases in which inoculation produces dramatic improvement or dramatic exacerbation of symptoms, have been impossible to decide whether a dose of vaccine was *doing good or harm, whether it should be increased* or diminished, and after what interval inoculation should be repeated.

But the guidance furnished in treatment of individual cases was not, as a matter of fact, the chief intellectual profit gained from our measurements of the opsonic index. (We made for many years 30,000 to 50,000 of such measurements annually at St. Mary's.) We learned from those measurements *principles that seem to me to lie at the very foundations of medicine.* Let me enumerate them.

(1) To begin with, we learned from these measurements that a succession of negative and positive phases such as I had described [8] in connexion with typhoid vaccination occurred when any vaccine was inoculated in quantity sufficient to produce appreciable constitutional disturbance. With regard to the negative phases, I had already in connexion with prophylactic inoculation pointed out that a negative phase means a temporarily lowered resistance to bacterial attack, and that, therefore, a negative phase should never be induced in a patient who is living in infected surroundings. The same principle holds *a fortiori* of a patient who is already the subject of an infection. Here the induction of a negative phase may lead to an exacerbation and a dissemination of the infection.

(2) The second general principle which was learned from measurements of the opsonic index (and Dr. John Freeman took a conspicuous part in the initiation and development of this research) was that *auto-inoculation* (the term had to be invented) can be artificially evoked by a large variety of procedures, and may also occur automatically. Such auto-inoculations produce negative and positive phases in exactly the same way as inoculations of vaccine.

We further learned in connexion with auto-inoculations that they can be produced in patients by active and passive movements, and by sending an ampler lymph stream through an infected focus (the so-called *stagnation method* of Bier). Further, that they can be produced by helio-therapy, radio-therapy, and the application of heat. And we learned also, quite early in our investigations, that automatic auto-inoculations occur whenever a patient who is the subject of an extensive infection is allowed out of bed. Finally, it was in this connexion brought home to us that in a progressive infection such as phthisis—the same applies, of course, to all acute infections—there sooner or later supervenes a stage when the biography of the patient—even when he is kept completely at rest—resolves itself into a succession of spontaneous auto-inoculations. It is the signal merit of Dr. Marcus Patterson to have applied these principles to practice in the treatment of phthisis, and to have realised that success depends largely upon the regulation of the auto-inoculations by the regulation of exercise, and to have appreciated further that the most rapid and effective remedial treatment for pyrexia produced excessive auto-inoculations is absolute immobility in bed.

(3) A third advantage—and this was, of course, a

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[8] Treatise on Antityphoid Inoculation. Constable, London 1904.

question of purely practical as distinguished from theoretical importance—gained from our innumerable measurements of the opsonic index undertaken before and after inoculations undertaken upon patients, was that we learned what quanta of the various vaccines can be administered to slightly infected and non-pyrexic patients without risk of inducing a negative phase.

(4) The fourth advantage gained from our measurement of the opsonic indices of patients was that through these there was formulated a general schema or principle of dosage. The all-important principle which was arrived at is that the dose of vaccine administered to a patient should be inversely as the number of microbes affecting (i.e., delivering antigen) into his circulating blood. In other words, we should in constitutional infections give only minimal doses of vaccine; should give intermediate doses to patients suffering from a strictly limited local infection; and should exploit large doses which produce negative phases only in healthy patients and for prophylaxis.

OPSONINS AND PHAGOCYTOSIS.

Having shown what important principles were learned from our measurements of the opsonic power of the blood-serum, I turn to the question whether we have in the opsonic index a true measurement of the phagocytic power of the blood.

My original idea—based upon investigations carried out with S. R. Douglas [9]—was that the opsonic index furnished a true measure of the phagocytic power of the blood. That conclusion was arrived at by taking from our out-patients (these were non-pyrexic and, therefore, probably non-auto-inoculating patients) bloods with high and bloods with low opsonic indices, and comparing the leucocytes of these bloods with those of our own bloods. We employed for that purpose what I have since called the *chiastic procedure.* That procedure consists of digesting with a microbic suspension: (1) the patient's washed corpuscles used in conjunction with his own serum; (2) his corpuscles used in conjunction with a normal serum; (3) washed normal corpuscles used in conjunction with normal serum; and (4) these corpuscles used with the patient's serum. The event of these operations carried out on our out-patients showed that in their case the amount of phagocytosis was determined almost entirely by the serum, and hardly at all by the corpuscles employed in the phagocytic mixture.

Afterwards S. G. Shattock and L. Dudgeon corrected these observations. They employed melanin granules instead of microbes, and carried out the tests upon pyrexic and auto-inoculating, instead as we had done upon patients who were non-pyrexic and, presumably, non-auto-inoculating patients. Shattock and Dudgeon's [10] investigations clearly demonstrated that the phagocytic avidity of the leucocyte is a variable factor, and that the phagocytic avidity of a patient's leucocytes may sometimes be much greater and sometimes much less than that of the normal leucocytes. Their investigations—their results were, as already mentioned, obtained with melanin granules—further established that phagocytic efficiency is a non-specific function of the leucocyte. These fundamentally important observations show that opsonic power is, at any rate, in pyrexic cases, a fallacious measure of the phagocytic power of the blood.

We have in the fact that the phagocytic avidity of leucocytes may suffer change a possible explanation of our having often found very high opsonic power in patients dying of phthisis. Examination might have shown these high indices to have been counterpoised by diminished phagocytic avidity. For in following up the observations of Shattock and Dudgeon we have found that the general rule in severe bacterial toxæmia is for the efficiency of the patient's leucocytes to be low while his opsonic index is high. It is easy to see a possible causal connexion between these two findings. The leucocytes may deplete themselves of antibacterial elements by parting with these to the blood fluids.

I now pass to an issue even more fundamental than that which was raised by Shattock and Dudgeon. We may ask ourselves whether a measurement of the phagocytic power furnishes in any case an adequate measure of the antibacterial power of the blood. That question must be answered in the negative. And our answer must be in the negative—*first,* because the leucocytes can kill bacteria not only intracellularly, but also extracellularly, by excreting bactericidal elements into the surrounding fluids; and *secondly* (and Douglas [11] has examined this question in detail), because phagocytosed microbes may fail to be digested in the leucocytes of one blood while they are in the leucocytes of another blood rapidly digested.

It follows that we cannot, if we wish to arrive at a true measure of the antibacterial power of the blood, content ourselves with measuring phagocytic power. We must measure the actual bactericidal effect exerted.

(To be continued.)

THE TECHNIQUE OF INTRALARYNGEAL INJECTION OF LIPIODOL,

WITH DESCRIPTION OF SPECIAL APPARATUS,

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LIPIODOL is a combination of iodine and poppy-seed oil containing 40 per cent. of the former. It is of a pale amber colour and medium consistency when cold but thins considerably at the body temperature. It is non-irritating and is comparatively rapidly absorbed from the lung tissue. Occasionally it gives rise to iodism, but not so often as might be expected from its large iodine content. It is opaque to the X rays, and this property renders it, when injected into the bronchi, of the greatest value in the diagnosis of certain conditions of the lungs and bronchial tubes which would otherwise remain unsuspected, or, at best, a suspicion impossible of confirmation. To it we owe a fuller knowledge of certain pulmonary diseases, such as bronchiectasis, neoplasm, and pulmonary abscess, and are able to demonstrate the results of artificial compression of the lung in conditions of cavity formation.

There are two methods of introducing lipiodol into the trachea and bronchi, the most generally favoured of which is direct injection into the trachea through the crico-thyroid membrane by means of a needle and syringe. The other method is intralaryngeal injection after local anæsthesia of the pharynx and larynx has been produced, and is the subject of this paper. I do not propose to enter into a discussion of the relative values of these methods; each has its special utility under suitable conditions.

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[9] Proc. Roy. Soc., 1903, lxxii., and 1904, lxxiii.

[10] Proc. Roy. Soc. B., 1908, lxxx., 165.

[11] Proc. Roy. Soc. B., 1916, lxxxix.

There are, however, certain advantages associated with the intralaryngeal route. It is simple and well tolerated by nervous patients. Indeed, those who have been the subject of both procedures have expressed themselves strongly in its favour. The discomfort is very transient, and the procedure can be repeated almost indefinitely; one patient received six injections consecutively. It can be quickly performed, and the percentage of failures is very small. It is also free from the suspicion of "operation," is devoid of danger, and becomes a diagnostic routine.

It is probable that the intralaryngeal route has not found the favour it deserves owing to the absence of a satisfactory technique of general application, and the difficulty that has been experienced in producing effective anæsthesia of the larynx. On investigating this method it soon became evident that, if anæsthetisation of the larynx could be satisfactorily accomplished, all the rest would follow, the actual manipulation requiring little more than sufficient skill to use a laryngeal mirror in the left hand whilst the injection is made by a syringe held in the right. Attempts have been made to allow the oil to trickle into the larynx without the use of the mirror, but the result is uncertain, and usually the major part of the lipiodol is found in the stomach, instead of in the bronchi.

A Series of Cases.

The following list includes a series of patients upon whom the intralaryngeal route has been practiced

MEN.

In this list of cases bronchiectasis was demonstrated, except where otherwise stated.

No.	Chief symptoms.	Daily sputum.	No. of Injects.	Remarks.
	Cough and hæmoptysis.	2 oz.	2	Successful.
	Cough.	3 ,,	2	,,
	Silent.	0 ,,	1	,,
	Cough.	3 ,,	1	,, Negative.
	,,	½ ,,	1	Successful.
6	Cough and hæmoptysis.	20 ,,	1	Successful. Neoplasm.
7	Cough.	1 drm.	1	Successful.
8	,,	½ oz.	1	Successful. Failed through neck.
9	Silent.	0	1	Successful. Blocked bronchus.
10	Cough.	1 oz.	1	Successful. Chronic bronchitis.
11	,,	2 drm.	2	Successful.
12	,,	1 ,,	1	,,
13	Silent.	0	1	,, Negative.
14	Cough.	2 oz.	1	Successful.
15	,,	3 ,,	1	Not entirely successful.*

* Anæsthesia not complete.

WOMEN.

No.	Chief symptoms.	Daily sputum.	No. of Injects.	Remarks.
1	Hæmoptysis.	0	1	Successful.
2	Cough.	Very small.	1	,,
3	,,	2 drm.	1	,,
4	,,	3 ,,	1	,,
5	,,	¼ oz.	6	Successful. Simple bronchial stenosis.
6	,,	3 drm.	2	Nervous: failed first time. Second time successful.
7	,,	1 oz.	1	Successful.
8	,,	6 ,,	1	,,
9	,,	1 ,,	1	Failed. Very nervous. Swallowed persistently.
10	,,	½ ,,	1	Successful.
11	,,	1 ,,	2	,,
12	,,	1 ,,	2	,,
13	,,	2 ,,	1	,,
14	Silent.	0	1	,,
15	Cough.	5 oz.	1	,,
16	(See below*).			Failure.
17	Cough.	¼ oz.	1	Successful.

* Patient highly nervous and would not open her mouth.

The series includes 32 cases—15 men and 17 women—who, between them, have had 43 injections. There were three failures, two of which were complete and due to nervousness, while the third was not entirely successful owing to incomplete anæsthesia. Many of these patients were sent into hospital with a diagnosis of pulmonary tuberculosis or for observation and diagnosis under the suspicion of pulmonary tuberculosis. The amount of sputum in many of the cases was small, but in some five, six, and even twenty ounces daily were brought up.

It is worth noting that hæmoptysis was complained of in three cases. In one of these neoplasm was demonstrated; in the other two sputum, physical, and X ray examinations were negative, and not until lipiodol was used could the real condition underlying this symptom be shown—*viz.*, bronchiectasis. This finding supports the view, based upon other examinations of the same kind, that some cases of hæmoptysis in which physical signs are entirely absent, and in which an X ray examination has been also negative, are not due to tuberculosis, but to bronchiectasis, and that this origin for the blood-spitting must be borne in mind and excluded in cases presenting this symptom before the diagnosis of pulmonary tuberculosis is made. It is probable that as the number of examinations by lipiodol increases this association will be recognised more frequently, and that certain cases of hæmoptysis hitherto regarded as tuberculous must be reviewed in the light of this possibility.

The number of cases in the table is not great, having been confined to those investigated by the method under review, but it is sufficient to indicate that there are few in which the intralaryngeal method may not be confidently expected to be entirely successful. How far it can be applied in children has yet to be shown, but it is unsuited for those below a certain age, when a general anæsthetic is usually necessary.

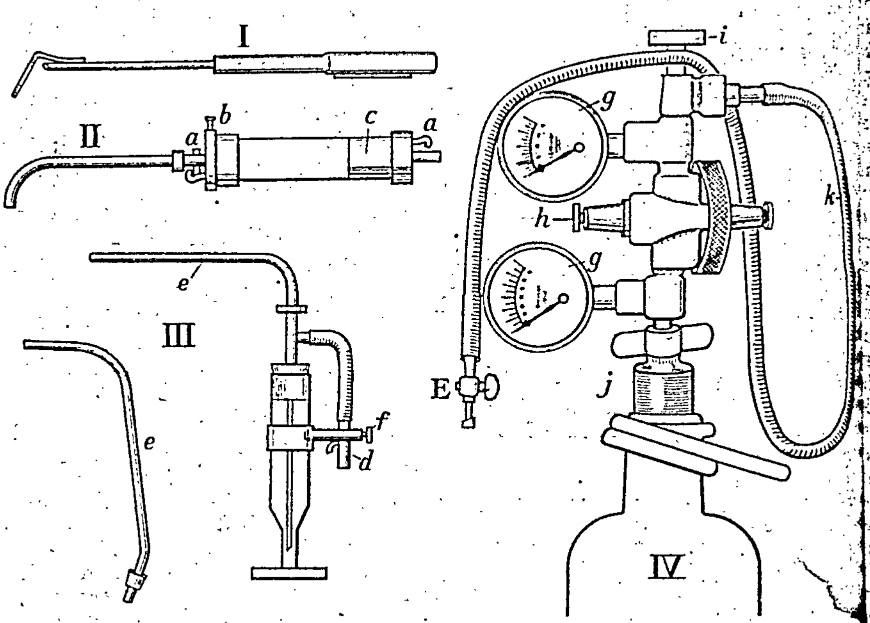
Method of Anæsthesia.

In the earliest attempts to work out a technique, the throat and larynx were anæsthetised with cocaine by means of a swab. This was unpleasant to the patient and caused so much discomfort that, by the time the anæsthetisation was completed, he was not in the best condition to tolerate the introduction of the lipiodol, and it became clear that an entirely satisfactory technique could not be evolved unless local anæsthesia could be produced in some other way. It was accordingly decided to use a specially designed atomiser but, owing to the necessity of holding it in the right hand whilst using the laryngeal mirror with the other, the method required unusual skill and was unlikely to be of general utility. The idea of using compressed air then suggested itself. There were difficulties to be overcome, and various methods were tried, more or less successfully.

Finally, it was found that the ordinary high-pressure compressed-air cylinder could be used quite satisfactorily if suitable conditions were complied with, and its introduction has greatly facilitated the procedure needed to obtain the desired degree of anæsthesia. It has not been necessary to use more than 25 minims of a 5 per cent. solution of cocaine, and of this quantity the major part is spat out of the mouth.

Introduction of Lipiodol.

Anæsthesia having been produced, there remains the problem of introducing lipiodol. This may be accomplished by injecting the oil directly into the trachea by means of an ordinary laryngeal tube and syringe operated by the fingers and thumb of the right hand, whilst the laryngeal mirror is held in the left. In expert hands this is comparatively easy, but to the unskilled in laryngeal work it presents certain difficulties, and to simplify the method I have devised a syringe in which compressed air expels its contents, leaving the fingers entirely free to control the injection. In order to reduce accessory apparatus to a minimum, I have modified the ordinary form of laryngeal mirror with attached electric bulb, to render it more easy of manipulation. It is light, straight, and easily carried, avoids the necessity for a head mirror, and is more comfortable for use by an operator wearing glasses.



I. Laryngeal mirror. II. Lipiodol syringe, showing (*a*) bayonet joints for attachment of laryngea tube extension and two-way tap respectively, (*b*) finger-control valve, (*c*) piston. III. Spra with (*d*) bayonet joint for attachment of two-way tap, (*e*) straight and curved laryngeal tube (*f*) finger-control valve. IV. Compressed air cylinder carrying automatic pressure regulat (*g*) high and low pressure gauges, (*h*) safety valve, (*i*) regulator valve, (*j*) main compress air cylinder valve, with lever folded, (*k*) rubber connecting tube carrying two-way tap which is fitted to the spray or syringe as required.

The details of the apparatus are as follows :—

The compressed air cylinder is controlled by an automatic pressure-regulator which performs the function of delivering the air at a pre-arranged working pressure, and of maintaining it at that level. It is provided with two gauges, one indicating the pressure, and so the amount of reserve air, in the cylinder, and the second showing the working pressure in the delivery tube. A safety-valve, which prevents excessive pressure being accidently produced in the apparatus, is also provided. A rubber tube fitted with a two-way tap and a bayonet joint conveys the air to the atomiser or to the syringe as may be required.

The atomiser consists of a glass container, graduated in minims, and of a narrow bore, which allows it be held at an acute angle without affecting its working. It is provided with two delivery tubes, a straight one to spray the soft palate and fauces, and a curved one for the larynx. It is controlled by a small valve clipped to the glass container and operated by the thumb or finger.

The lipiodol syringe consists of a glass or metal cylinder of the usual pattern fitted with a hollow piston moving freely in its interior. This piston can only be removed from the rear end of the syringe, a flange having been left at the forward end in order to prevent its accidental expulsion.

Screwed on to the barrel of the syringe are two metal end pieces, the one in front carrying a valve controlling the expulsion of its contents, whilst that at the rear is provided with a bayonet joint for attaching the two-way tap. The latter placed in the " on " position admits air to the piston, and when turned " off " cuts off the air supply and places the barrel of the syringe behind the piston in direct communication with the atmosphere, thus enabling the piston to be returned to the rear end for the purpose of refilling.

The laryngeal tube is removable, and is attached by a bayonet joint. It has not been thought necessary to graduate the syringe, as this tends to weaken the glass and occasionally leads to fracture on slight causes. An ordinary laryngeal mirror with lamp and head reflector can, of course, be adopted, but the special mirror will be found simple to use. Its means of illumination is the small battery contained in the handle, which consists of an ordinary pocket flash-lamp. The battery has a " life " of about two and a half hours if used intermittently, and is always obtainable. It is advisable to keep one or two spare batteries, and when the light begins to fail the battery can be replaced with a fresh one, and will regain its voltage if set aside for 24 hours.

In devising the apparatus I have attempted to make it as " foolproof " as possible, but there are one or two points which should receive attention in order to obtain the maximum efficiency. In assembling the parts of the syringe the flanged end should always be in front, otherwise—should the operator forget to turn off the two-way tap after use—the piston may be ejected when the front end is screwed off to refill. Secondly, unless the two-way tap is turned off when the injection is completed, the piston cannot be returned to the bottom of the syringe to allow of refill or removal. Thirdly, the piston must be inserted solid end first.

The apparatus is used as follows :—

The rubber connecting tube having been attached to the regulator valve, the latter, along with the two-way tap, should be opened. The main cylinder valve should now be opened slowly by gently striking the extended lever with the hand, and when the air begins to flow the two-way tap should be closed and the regulator valve left open. (It is unnecessary to open the main cylinder valve more than is sufficient to maintain a steady working pressure in the automatic regulator gauge.) The two-way tap is now attached by its bayonet joint to the atomiser and turned into the " on " position. The atomiser is used in the ordinary way, and is controlled by means of its own finger valve. When anaesthetisation is finished the two-way tap should be turned off and disconnected from the atomiser.

Meanwhile the front end of the syringe is screwed off, the piston pushed down as far as it will go, and the required amount of warmed lipiodol poured in. The end is now replaced, screwed down just sufficiently to be air-tight; the laryngeal tube, if not already in position, is attached by its bayonet joint, and, care being taken that the rear end is also screwed down air-tight, the two-way tap is turned on. With the syringe held vertically, the valve in front is carefully depressed until all the air is expelled ; the valve is then released and the syringe is ready for use. The precise method of manipulation must be left to individual preference.

When the injection has been made the two-way tap must be turned off, thus releasing the air behind the piston; the front end can now be screwed off, the piston pushed back as far as possible, and the syringe refilled if necessary.

The following technique has been found to give the most satisfactory results : If the patient is bringing up much sputum the bronchi should be previously emptied by instructing him to lean over the side of the bed and to cough, whilst the head and shoulders are held as low as possible. Then the patient sits in a chair *facing the operator*, and it is fully explained to him that the entire procedure is a *simple one*, and any apprehension he may have allayed. The lower teeth are covered with a swab, in order to protect the tongue, which should be *protruded as far* as possible and gently held by an assistant. The soft palate, fauces, and the posterior part of the tongue are sprayed, using the straight tube of the atomiser *for* his purpose. It is then *replaced by the curved* one, he laryngeal mirror is introduced, and the anterior nd posterior surfaces of the epiglottis are carefully prayed. This *done*, the end of the tube is passed own over the epiglottis and the interior of the rynx is sprayed. Passing the tube still further, he vocal cords are similarly treated, and, if thought ecessary, the tube can be passed between the cords, nd the upper part of the trachea likewise sprayed. etween each of these steps the patient should spit ut the superfluous solution.

The atomiser is now replaced by the syringe, preously filled with warm lipiodol, and the patient ld *to cough* and clear his throat of mucus, and terwards to breathe quietly and in the normal anner, leaning towards the side into which is proposed to introduce the opaque material. e should be carefully instructed to avoid coughg and swallowing whilst the injection is in gress and to make no attempt to phonate, but ould he, for any reason, wish the injection to be pped, *to* raise the hand, when the operator will move the instruments from his mouth and make y readjustments that may seem desirable.

The curved cannula attached to the special syringe passed over the epiglottis, the valve in front gently pressed, and the lipiodol allowed to flow between vocal cords. Flooding the larynx, which may ur if the injection is made too rapidly, should avoided. There is no special danger associated this, but the patient may become alarmed and peration interrupted.

hen the injection is completed the best results obtained if the patient is X rayed at once, both the erect and recumbent positions. Afterwards he ould not take any *food* or beverage for three four hours, in order to allow the effect of the æsthetic to pass off.

The actual injection can be made with the patient ther sitting up or semi-recumbent on the X ray able when, if a little care is exercised, there is no pecial tendency for the oil to flow into the œsophagus, nd it has the additional advantage that the patient ready for the X ray exposure at once, or can be olled to one side or the other, or the hips raised to nable the *oil* to flow in whatever direction may be esired. As there is no special inconvenience attaching to the operation and usually patients offer very ittle objection to repetition, it is probably better not o attempt to inject the whole of both lungs at one itting but to make a second injection later, injecting not more than 20 c.cm. the first time.

Severe cough and large amounts of sputum do not contra-indicate the procedure and give rise to no inconvenience, provided the tubes or cavities are emptied by posture, as already indicated. In one case a patient coughed up six ounces of sputum just after the commencement of anæsthetisation, notwithstanding which it was completed and the lipiodol injected without further trouble. No special discomfort was complained of, and the result was quite successful. In only three of the cases referred to in the Table was lipiodol found in the stomach in any appreciable quantity. This occurred before the technique had been fully worked out. No tendency to swallow has been noticed, and in no case has a patient complained of any special discomfort either during or as the result of the operation.

The following solution may be conveniently used in the atomiser: Solution adrenalin (1–1000), dr. 2; potassium sulphate (2 per cent.), dr. 2; cocaine hydrochloride (10 per cent.), dr. 4; (acid carbol., 0·5 *per cent., as solvent*).

For those who require a smaller compressed-air cylinder the British Oxygen Company make one containing ten cubic feet only, which takes the standard regulator valve fitting. An oxygen cylinder may also be used.

I am deeply indebted to Dr. G. S. Todd, the resident medical officer of the Brompton Hospital, who has largely helped to work out the steps of the technique, and without whose skill and assistance it might have been difficult or impossible to perfect the operative procedure detailed. I am further indebted to Mr. Spence, the chief dispenser, for the valuable assistance which he has given me.

I wish also to record my thanks to Messrs. Down Brothers for their care and skill in making the apparatus from my drawings and calculations, and to the British Oxygen Company for the trouble they have taken in adapting the regulator valve for the special purposes required.

SOME CASES OF "TRAUMATIC NEURASTHENIA."

By Millais Culpin, M.D. Lond., F.R.C.S. Eng.,

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The original conception of traumatic neurasthenia was recalled by Sir Farquhar Buzzard seven years ago in an address to the Oxford Medical Society[1] when he spoke of the view that "an injury of any degree of severity and inflicted at any site may produce a physical condition of the nervous system, with characteristic signs, but without any morbid anatomy, to which the name traumatic neurasthenia is fairly applicable." He showed how legal judgments are based upon the belief that there exists such a disorder which, having a name, is part of the established order of things and in no need of further definition. It should, however, be regarded as an emotional state, an anxiety neurosis, dependent not on any physical disturbance caused by trauma, but on a number of psychological factors. The condition is not the result of an injury, but of the knowledge that an injury has been sustained, together with the ability to shift the responsibility for the injury and its effects on to other shoulders.

Yet difficulties would remain even if the truth should become recognised that a condition of ill-health and disablement can be the result of psychological influences alone. A decision that compensation could not be recovered for neurasthenia following an accident might be the subject of an outcry, though the contrary decision is a direct encouragement to the development and maintenance of that state. The legal problem, however, said Sir Farquhar Buzzard, is not for us to solve, though sooner or later it must be faced. It is our duty to prevent the development of the condition, and our weapons must not be merely the advice to take plenty of exercise in the fresh air, and a bottle of medicine repeated week after week, but a free expenditure of time devoted to fathoming the contents of the patient's mind, and an honest endeavour to re-establish a healthy mental outlook.

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[1] The Lancet, 1923, ii., 1285.

With these views I am in almost complete agreement. I differ in so far as I think we must admit that an anxiety state can follow various kinds of shock in the absence of the compensation factor. In many cases that come to the stage of compensation the anxiety state occurs first, and is then neglected and allowed to develop, so that the unfortunate patient is given no alternative but to devote all his energies to the obtaining of compensation. The fears that make up so much of the symptoms of an anxiety state are not imaginary (whatever that may mean) but are to the sufferer as real as toothache. He sees in them a proof of damage to his nervous system (whatever that, too, may mean), and is compelled to cling to compensation as his only safeguard for the future. In cases that are treated early enough the man may eagerly grasp at a correct presentation of his state, seeing a gleam of hope hitherto absent through the belief in some mysterious injury to his nerves.

Thirteen years ago, in an article on the Early Stage of Hysteria,[2] I maintained that no example of hysteria had ever been accurately described ab initio, for the reason that anyone capable of recognising and describing it would not allow it to develop. Although the subject is not so simple as I then believed, yet my observations point to a similar deduction about traumatic neurasthenia. Even the medical men acting for accident insurance companies take for granted the old conception or, as so often happens in the minor psychoses generally, accept an initial diagnosis of some physical lesion that later gives way to the doubtfully more correct diagnosis.

This view of the preventable nature of hysteria and traumatic neurasthenia is perhaps not easily accepted by those who take the psycho-analytical view of the minor psychoses, which involves more subtle and complicated mechanisms. Experience compels me, however, to accept both views, and a sufficiently wide survey shows no incompatibility. My work for the Industrial Health Research Board[3] satisfied me that in the working population there is a reservoir of people who, suffering from symptoms that interfere only slightly with happiness and efficiency, are nevertheless ready to fall victims to any pseudo-neurological disorder that may offer itself. That disorder, though called into being by immediate causes, is intimately linked with the previous condition, and, if left to develop, becomes consolidated with it. Thus a traumatic neurasthenia is identical in its general structure with those other disorders for which psycho-analytical principles offer a pathology and a means of treatment; it differs from them in the influence of compensation in conjunction with the anxiety patient's fears about his economic future. An accident, some more or less severe anxiety symptoms, a false pathology accepted by doctors, lawyers, and the public, a lively apprehension about the future, together with compensation in place of understanding and rational treatment, make up a combination that has brought many a decent citizen to disaster.

Compensation Cases.

Last year I had the opportunity of examining a batch of miners receiving compensation for traumatic neurasthenia. They were examined at the rate of two per hour, and a physical examination was necessary, though in some cases it was only a placebo. The history of each case was before me, and the following notes will show what a medley is to be found under that unfortunate diagnosis and how each case presents a different problem.

CASE 1.—Aged 47. Married; two children, aged 6 and 11. Injury to head by fall of stone, July 25th, 1916. Suffered concussion. Returned to work August 24th, 1916. Resumed incapacity Oct. 9th, 1918. Doctor reported that he was suffering from bruised head and giddiness. Got work on the surface, and on April 11th, 1919, doctor reported: "He is in a very nervous condition, hands tremulous and pulse very rapid; probably neurasthenia following injury." In 1926 the matter was referred to the Miners' Welfare Committee, who stated they were not in a position to deal with cases of neurasthenia. Report on Nov. 15th, 19 states: "Traumatic neurasthenia still very bad, very shaky, couldn't do anything."

The man showed coarse tremors. Described feeling being stared at which prevented his going about. H fears of traffic and described hallucinations of traffic go "contrariwise." There were puckered scars on the che and a tumour of the lower jaw, which was ankylosed. F three years he had "lived by suction."

The presence of the tumour—probably acti mycotic—overshadowed the nervous condition, whi was a typical anxiety state.

CASE 2.—Aged 34. Two children, 10 and 3. injured by a shot on June 25th. The left eye had to removed. Slight corneal scar on right eye. Face b disfigured. Half right ear missing. On April 11th, 1 doctor reported that the man had to wear blue glasses would never be any better. On June 26th, 1927, a re said: "The most important effects of the explosion h been on the nervous system, and on the eyes. The e on both have been severe. He shows all the signs profound neurasthenia. The intolerance of light is d this cause, not to the eye injury. A little improve in the condition of his nerves would enable him to disp with the very dark glasses which he wears; they a themselves a depressing agent . . . . He needs to be out of the rut in which he is at present. Otherwise he make no progress."

The man appeared before me accompanied by his and wearing the darkest possible glasses. He showed yielding grip that I regard as a hysterical stigma. plained of headache and being kept awake by pain. " panel doctor says it's the nerve at the back. It's the nerve. I go trembly when I am away from anyone. least bit of trouble upsets me. I never go out. U to sit and nurse my eyes. I've come out of bed to see I don't know where there's another man who's stood I've stood." When I suggested that he should try t without the glasses his wife said, "If he does that have to go to bed altogether."

A hopeless case of hysteria with anxiety. attribution of the hysterical photophobia to "profo neurasthenia" is, I am afraid, quite orthodox, the reference to the condition of his nerves.

CASE 3.—Aged 36. Married; three children. July 11th, 1929, was found to be suffering from s caused by witnessing a fatal accident to a fellow work Doctor reported that his pulse was very rapid and h very trembling. On March 15th, 1930, doctor rep that the man was suffering from shock and the cond remained unchanged.

The man complained to me of pains in his head. H bad day last week when he felt down and out. Wo about money; is on light work. When asked to tell ab the accident he refused. "I want to forget that. I to forget it." Asked about dreams he said: "It's alw one dream" (i.e., the accident). "My wife says I n jump out of bed. I have to keep to the shop side for f of the traffic rushing at me. I see things in the dark. must sleep with a light. It's always the one thing." this point I suggested that perhaps if he talked to some about the accident it might help him. He said: "I always been on the hard side. I don't believe in telli people those things." Here he cried and admitted that often cried when alone. For three weeks he had stuck down pit, but fear made him sweat so much that his cloth "wanted to go through the mangle." When at work felt all the time that the roof would come in again. I fina prevailed upon him to tell me about the accident. A f of roof had buried one man, and whilst P. M. was directi rescue work another fall buried one of his mates. tried to dig this man out; he felt him with his hands the dark and could tell by the feel that he was dead. (told this under obvious emotional restraint.)

The picture found on proper investigation is wonderful contrast to the meagre account of h ondition first given, but he would have told me othing about his real symptoms if I had not pressed im. The case is clear-cut, and any psychopathoogist will agree that with informed treatment the rospect of recovery is excellent. The man was a tout-hearted fellow, and I feel strongly about the ct that, short of bringing him to London, there was o means of giving him that psychological treatment hich would restore his peace of mind and efficiency. e must all accept the responsibility for our neglect f modern teaching and for clinging to the pernicious ord "neurasthenia" and all that it involves. In is case a certain amount of technique would be ecessary in the treatment. I refer to the process of reaction, which is successful in recent cases like is; the effort to forget would perhaps be approved some of my readers, but I can assure them that is a disastrous way of handling such an experience. the circumstances I did not venture there and n to use the method described in Case 11.

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[2] Brit. Med. Jour., 1918, i., 425.

[3] The Nervous Temperament. I.H.R.B. Report No. 61. H.M. Stationery Office.

CASE 4.—Aged 33. Married; five children. Suffered electric shock on June 8th, 1928. On June 30th doctor orted: "*Effect of electric shock; does not look well;* se rapid, says he is much better." He returned to work, on Sept. 10th he broke down and had to be *carried out* the pit. There was some difference of opinion as to ether his condition could be attributed to the shock. was examined on Oct. 17th by a doctor who elicited ety *symptoms, discussed the alternative* of malingering, reported that, "This man is suffering from neurasthenia, direct result of the electric shock. In my *opinion,* ough there may be some exaggeration, he is quite uine *in* his complaints. I think a change at Skegness ld brace him up." On Jan. 25th, 1930, a doctor reported: "He is anæmic and neurasthenic; could do a *lot* of k on surface."

t the interview his palms were sweaty and his grip led to yield; he talked freely about aches and pains his heart (*these patients often withhold the anxiety* ptoms until they recognise that these will be accepted enuine). Then he admitted that he got scared and ated. "I fancy things and dream awful; wake in a . Can't sleep without a light. (Asked what would n if his wife took it away.) "I'd soon move down-. Can't stand the kiddies talking. If you came ed me you'd set me off. I always dread the traffic; akes me go all of a sweat. It's no good me going down am. A surface job might take a lot of this out of me." said he had paid 8 guineas for massage in the hope of cure.

This man is in a severe anxiety state. Proper ndling of the case from the start might have vented this deterioration of a decent workman, treatment would now be a lengthy matter and outcome doubtful.

CASE 5.—Aged 69. On April 29th, 1927, a fall injured his ad. He was trephined for a fracture just above the right stoid, where there is a deep depression bigger than a f-crown. Doctor's report on Nov. 22nd, 1929, said: "Skull fractured; neurasthenic; looks well; pulse al; will never improve." Complains that he is deaf that his head is all of a rumble. Gets shaky when nding. Jumps at a miss-fire. Can travel in a motor-bus. es to the pictures; reads books and newspapers. "Might well be dead if I didn't have a bit of fun. I've smoked ce I was 7 and it hasn't stopped my growth." He has a ar of losing his balance when he comes downstairs.

In view of this man's age and the severity of his jury, which affected the internal auditory apparatus, is mental outlook is very good and the diagnosis neurasthenia is redundant under any hypothesis.

CASE 6.—Aged 40. Married; three children. Sustained jury to his back by a fall of bind on Oct. 17th, 1925. On arch 6th, 1926, doctor reported "Concussion of spine; ray report is 'fracture transverse process vertebra.' is back is doing well, but general nervous condition bad; think a convalescent home at the sea is indicated." On arch 31st, 1926, doctor reported: "The fracture united ell and there was no organic lesion, but he was badly haken and his nerves were upset. He had tachycardia or a time. For the last six months his pulse has been ormal." Notice of reduction in the compensation was erved, but the doctor reported that the reduction had so pset the man that at the moment the doctor considered he was unfit for work. He was therefore reinstated on full compensation. A note on Sept. 21st, 1929, says: "The colliery are unable to start him at the pit, and the man is trying to obtain outside work."

At the interview he complained that he was not feeling well. "My back gives way when I walk. I burst into a sweat if I slip. I get pain in the head on *bending.* The strength goes out of my legs. I can't stand the noise of picture shows. I get a pain in the privates." I asked: "Do you feel anything else *the matter?*" and pressed the question without eliciting further *symptoms.* *His wife* was present and I asked her: "How does he sleep?" She told of how she wakes him up because he makes all *sorts* of noises. The man, now asked about these noises, said: "I dream of the accident and the *wife* wakes me up," then admitted that he was restless and afraid in a room by himself (claustrophobia). Is frightened in the dark. "*If* I meet a cat or dog in the night I burst out all of a sweat. Nervous in a bus. On the pavement I keep thinking the buses are running into me." Asked whether he could go down pit if his back were all right he said, shamefacedly but sincerely, "It's not a nice place to go when you are frightened." He had *given reactions* to examination of his back that might be either hysterical or malingering.

This man had never told about his anxiety symptoms and would have withheld them from me if he had not realised that I was taking them seriously. It is possible that his back symptoms were deliberately feigned, but even if that were so I should not call him a malingerer. In the absence of recognition of his real symptoms he was compelled to develop hysterical symptoms or malinger them. I amused myself by asking why he had not told other doctors about his fears; he made no verbal answer, but I translated the look he gave as "I thought you had more sense than to ask me that."

A recognition of his true disability, even in the absence of treatment, might have saved four years being wasted in the expectation of a claustrophobe with a severe fear of the dark ever going to work again down the pit. In miners' nystagmus, which is a variant of traumatic neurasthenia, I believe that the night-blindness is a hysterical conversion of fear of the dark.

CASE 7.—Aged 32. Married; two children. On April 6th, 1927, was pinned between a fall of stone and a tram, was taken by ambulance to hospital and diagnosed fractured pelvis. On Oct. 24th doctor reported: "He walks fairly well on the level; there does not appear to be any tilting." He went back to work on Dec. 30th, 1929, but ceased the following day. On Jan. 6th, 1930, a report read: "He has a fractured pelvis, but a sitting down job 50 yards from the pit bottom has been found, and I think he is quite able to do it." On March 13th, 1930, it was stated: "There is a good deal of neurasthenia about this case." The man said he had never been free of pain since the accident. Couldn't bend. Sometimes has trouble with his water. Sweats between the legs. On examination he claimed hyperæsthesia to light pin-prick in the left lumbar and gluteal area, with pain to deep pressure. I flexed the right leg and said: "Of course you can bend this all right," and when I attempted to flex the left leg he resisted violently with loud groans. He stoutly denied any nervous symptoms. His wife likewise was annoyed that I should suspect them. Asked if he made noises in his sleep she said snappishly: "I don't stay awake to listen." I asked him if he walked "on the shop side of the pavement." He accepted that suggestion and explained that his walking was so insecure that he kept away from the kerb for safety.

I could suggest whatever physical symptoms I fancied, and have them accepted, but in the absence of nervous symptoms he regarded my search for them as an attempt to trap him. This mode of reaction is typical, and meets the common innuendo that those nervous symptoms found by the psychopathologist are suggested by him. I decided that the man's symptoms were a wilful attempt to deceive me. This case should be compared with the preceding one, with which it was identical on a superficial examination.

CASE 8.—Aged 46. Married, four children. On Dec. 24th, 1915, a piece of bind fell on his shoulder. He was taken home in an ambulance. On Jan. 7th, 1916, doctor reported: "Severe bruise over lower dorsal and upper lumbar spines; sphincters were affected for two days." Work and incapacity alternated till June 15th, 1919, when doctor reported: "Slight lateral curvature of spine and marked tenderness over spinal column." On Jan. 28th, 1921: "There is marked apparent tenderness over the spine and slight curvature. Movement of the back is fairly good. He complains bitterly of local pain that keeps him awake. I am inclined to think the case is more one of traumatic neurasthenia than of real organic injury." On March 6th, 1929: "There is no improvement in his condition. He states that he is 42 but looks 55. Complains of headaches and pain in the back. He can only control urine by passing it frequently. He is suffering from traumatic neurasthenia and some light occupation would tend to improve his condition."

The man's appearance was worse than the above description indicates. Haggard, spineless, wasted, with clammy skin, he was a picture of despair. Said he had been crushed all over his body. His legs go dead and his head aches. He dreams of the accident still and wakes frightened (statement volunteered). His wife broke in with: "Yes, he frightens me. If he goes to sleep he's always in trouble." Is not afraid in a bus, and denies specific fears. I tried to put it to him that he had given up all hope, and let himself go downhill, but that the effect of the injury must have worn off by now, and he ought to try to get some pleasure out of life. My reward came from the wife, who said, as a farewell to me: "He'll be in bed a month after this."

CASE 9.—Aged 47. Married, four grown-up children Was caught in a fall of coal on July 27th, 1923. On August 13th report said: "Crushed and bruised back and abdomen; he says that he vomited in the pit." On Oct. 22nd: "Alleged abdominal pain; his symptoms now are chiefly nervous; heart action very rapid." On Jan. 14th, 1924: "Valvular disease of the heart; pulse 130; he says he feels better." In June, 1926, doctor reported: "I attribute the rapidity and weakness of the heart to damage of the nerves of the heart caused by a severe crushing accident. The rapid action of the heart will tend to exhaust the heart and shorten life. I could discover no other cause likely to affect the heart in this manner, and with such a clear history available it is fair to attribute the man's condition to the accident." The man complained of his stomach and heart. "I'm beat to the wide. I got crushed and have not been right since. I go all of a jake." In answer to questions: "I always creep to the wall. It seems to be dread all the while." Has a fear of thunder—had it as a boy. Never went to pictures or to football. Wakes up frightened from bad dreams. Has given up smoking because of the effect on the heart. Pulse was 140 when resting; 160 after exercise; 132 two minutes later.

This man presented that syndrome, so common during the war called "disordered action of the heart" and invariably associated with its causative anxiety. He seemed to promise results from treatment and was sent to a physician familiar with this type of case, who wrote, however, warning me that he could rarely get good results in long-standing compensation cases and did not anticipate much benefit in this one.

CASE 10.—Aged 51. Married; two grown-up children. He alleged that on August 2nd, 1923, he got his head between a tub and a prop and bruised it. There is no evidence in the history that this happened or was of any severity if it did happen. He walked home, had supper, and told his wife he would have a smoke before going to bed. He seems to have gone away in a fugue state and was sent home by the police, who identified him by the tally attached to his pit clothes. His behaviour since has been very troublesome and erratic. Diagnoses have been offered of fright neurosis, melancholia, epileptic mania, and, of course, traumatic neurasthenia.

I found him a sensible man and he gave a history of various troubles of behaviour. I did not venture to add yet another diagnosis to the list, though I fear he will end up with a major psychosis. His initial fugue would probably have given up its secret to modern psychological technique, but it is not generally recognised that such technique is applicable to these cases.

The next case is given as a contrast to Case 3, and shows how a timely application of modern technique can at a single sitting arrest the process of deterioration. The diagnosis of neurasthenia was never made because the patient had the fortune to come under the charge of a woman medical officer, attached to her factory, who had discarded the diagnosis and accepted the psychological view. The following is the woman doctor's account of the case:—

CASE 11.—In the autumn of 1928, friends of the patient came to me to ask if I could do something for her as they were afraid she would do herself some harm; said they could not persuade her to be with them, that she persisted in keeping by herself, and stayed out all night walking by the Embankment. She would not eat and her work was suffering. These symptoms had arisen after the suicide of her father in July, 1928.

The patient, a forewoman aged 27, came to me ve pale and thin; reticent to the point of sullenness. Wo not answer when asked to tell what was the matter, after a few general questions said that she had lost appetite and could not sleep and was "terribly worri She was living by herself, as she could not go home to mother, who was queer and did not understand her had made her father do what he did. Here she bec emotional and cried bitterly. I made her lie down i quiet and darkened room and asked her to tell me what was thinking about. For a long time she wouldn't sp and then she said: "I can see it, the horrible thing. black and ugly . . . it's awful . . . . I can't, I can She buried her head in her arms and pressed her hands her eyes. I asked her to tell me what she saw, and she up suddenly and screamed and then with eyes wide staring she described how a policeman had taken he a place and she saw her father with a terrible look. him lying in a black open coffin. She cried for some and then became quieter and seemed to doze. Later friends came and took her home; she appeared pl to go with them. I saw her a few days later and she much quieter but very silent; said she was sleeping b I inquired from time to time how she was, and both she her friends said there was a great improvement, but she was still apt to have fits of depression and was difficult.

In February, 1931, I had a long talk with her fo purpose of this history. She had gained weight, pleased to talk, and answered questions helpfully, but still a bit shy. She gave an account of family strife c by a mother whose domineering qualities seemed pa logical, and whom she still blamed for the father's sui She now felt that her father's death was not a dre thing, that he was at peace, and there was some sor bond between them. She could think of her visit to mortuary but at night the shadows on the wall seem to like the black coffin. She made the best of her w though she did not like it; her hobbies are walking, te and music, with reading. Asked if she liked men replied: "Not young men; they cannot talk to one like older men. . . . The only man I ever loved was Dad She is grateful to and fond of her women friends, who good to her and put up with her when she was ill and diffic

This woman is still hampered by a parental fixati but a timely abreaction had produced a therapeu effect unattainable by the prescription of bromi and advice to "forget all about it." I have doubt but that similar treatment would have led to similar result in Case 3. The next case illustra a different method of handling a patient.

CASE 12.—Aged 34. Married; three young children. A skilled worker in compressed-air jobs. In June, 1930, an accident happened to the air lock. There was a rush for safety and this man was the last to get out. He was speechless, his stomach and neck were "drawn," and he was choking. This he attributed to the sudden change of pressure—*i.e.*, to caisson disease. Now he complains of severe pains; goes giddy and staggers; has been picked up in the street and taken into hospital; describes having injections and inhalations (probably amyl nitrite); has been in four hospitals and his wife has been warned to prepare for the worst; gives accounts of various diagnoses. Has a severe fear of the dark. Never goes out alone. Is afraid to travel on trains. He is receiving compensation of 3s. per week, but does not know under what diagnosis. In January last he sought treatment at Richmond Hospital where Dr. Geoghegan recognised the nature of his disorder and, judging him to be a decent man desirous of cure, asked me to see him. I elicited the history given above and confined my physical examination to testing his grip, which gave a hysterical reaction.

I gave him a straight talk, telling him that his symptoms had no relation to caisson disease, that they were the result of a severe fright which had upset his feelings and emotions, but that the most powerful microscope would find nothing wrong with his brain or nerves. It was for him to make the effort to recovery, but if he did not accept my view and make that effort he would go downhill and become a useless wreck. Then I demonstrated that his yielding grip was really under his control and that if he put his energy into it I could not open his closed fist. He and his wife took this onslaught so gratefully that I decided to help him to get treatment at the Tavistock-square Clinic and arranged to see him again at the end of a week. He came then, looking a different man, and said: "I've taken my medicine and am going to get well. I've come here alone, and that is the first time I have been out by myself for six months."

This case is not yet complete, but I have little doubt about the result. Clinically it is interesting n account of the unfavourable prognosis given to he wife—a story which I have no reason to disbelieve. once described a case in which the patient had been ut on the "dangerously ill" list and treated with owerful heart stimulants for a condition which a olleague was able to reproduce under hypnosis, his own embarrassment and fright. I saw the atient myself in his attacks and he looked moribund, et the whole trouble disappeared after the abreaction a suppressed emotional experience.[4] In Case 12 e attacks are probably reproductions of the emotional perience at the time of the original accident and ould be curable by abreaction, though the man's anged outlook may suffice to render that necessary.

Turning back to Cases 2, 4, 6, 8, and 9 we may ask hether those men had been given a fair chance recovery and whether we are justified in the perficial view that they cling to their symptoms fear of losing compensation. The situation s been thrust upon them as it is still being thrust on numberless other victims of an out-of-date ytho-pathology.

A CASE OF THROMBOCYTOPENIC PURPURA.

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A YOUNG woman at the age of 18 began to notice that she bruised very easily and often without any obvious cause. Previously she had always been healthy—apart from measles, scarlet fever, and an attack of shingles in childhood—and there was no history of any similar complaint or other forms of bleeding in any of the other members of the family. Paying no attention to these bruises, she was not incapacitated in any way until a couple of years later, when she had a severe menorrhagia lasting about three weeks. Before this, menstruation had always been normal, but afterwards, while recurring regularly at monthly intervals, it would last ten days and the loss would be excessive.

Her doctor gave her two injections of Hæmoplastin and a short course of calcium lactate by the mouth, but these had no effect and she became, in consequence, pale and anæmic, suffered from faintness, and had some œdema of the ankles after standing. Gynæcological treatment was next undertaken. The cervix uteri was dilated and the uterus curetted, and seven weeks later radium was inserted into the uterine cavity for 24 hours. Her blood count at this time was:—

Red cells	2,900,000 per c.mm.
White cells	11,000 " "
Hb (hæmoglobin)	32 per cent.
C.I. (colour-index)	0·5
Plat. (platelets)	96,000 per c.mm.
Retic. (reticulocytes)	Not counted.

Next she took cooked liver for about seven weeks. She tried ¼ lb. daily but did not like it, and only managed to take about half this daily quantity. Her condition was in no way alleviated, and, six weeks after stopping the liver, she was admitted to hospital under my care. During these six weeks she had had two severe attacks of menorrhagia, lasting 12 and 11 days respectively, and a third, less severe, lasting seven days, and one attack of nose-bleeding.

She was now 21 years of age, 8 st. 4lb. in weight, well nourished, but very anæmic. Examination revealed large subcutaneous bruises on the limbs, and a few purpuric spots on the chest and above the left ankle. The spleen measured 3½ in. on percussion, the liver was not enlarged, there were no enlarged glands, and the heart was within normal limits. Two teeth were rather carious, but no other features of note were to be made out except on examination of the blood. Blood examination at this time (Feb. 28th, 1929) showed:—

Red cells ..	2,000,000	Polymorph. ..	69 %
White cells ..	12,200	Eosin.	1 %
Plat.	15,000	Lymph.	22 %
Retic. ..	0	Large mono. ..	7 %
Hb	25 %	Mast	1 %
C.I.	0·56		

Red cells poorly stained. Average diameter less than normal; no nucleated reds or poikilocytes present.

The case was considered to be one of chronic thrombocytopenic purpura and, as the patient was averse from operation, the opportunity was taken to observe the effects of various remedies on the condition, and especially on the blood-platelets. With this object in view, the blood was examined regularly at weekly or bi-weekly intervals, while the patient was in hospital and afterwards at longer intervals. It was obvious that such liver treatment as she had had already over a period of seven weeks had not increased the number of platelets in her blood stream or alleviated her condition generally.

EFFECT OF VARIOUS REMEDIES.

She was tried first (Feb. 28th) on calcium lactate, grs. 15 t.i.d. orally, and at the end of one week it was found that the red cells had increased to 3,600,000 per c.mm. and the hæmoglobin to 30 per cent., but the white cells had fallen to 6200 per c.mm., and the platelets were unchanged (15,200 per c.mm.); subcutaneous bruises continued to appear spontaneously.

The calcium lactate was continued but cod-liver oil emulsion (2 drachms twice daily) was then given also, and ultra-violet light administered twice weekly. It was thought that the vitamin D in the cod-liver oil might assist the calcium metabolism, and that the ultra-violet light, as well as the vitamin A in the oil, might produce an increase in the blood platelets. In this connexion it may be recalled that Cramer, Drew, and Mottram[1] found in rats that the blood-platelets were reduced in vitamin A deficiency, and that the addition of the missing vitamin A to the diet was followed by a rapid rise in the number of platelets, provided that the animal had not been allowed to suffer too long and too severely from the deficiency. In further experiments these authors[2] found that exposure to ultra-violet light increased the number of platelets in rats whose platelet count had been reduced through being born and kept in darkness on a diet of low vitamin content.

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[4] Psychoneuroses of Peace and War. Cambridge, 1920, p. 112.

At the end of a week's treatment with ultra-violet light, cod-liver oil and calcium lactate, the patient's red cells had increased to 4,100,000 per c.mm., but the hæmoglobin had remained at 30 per cent., the white cells at 6000 per c.mm., and the platelets at 15,000 per c.mm., and subcutaneous bruises continued to appear spontaneously as before, although her general condition seemed better.

Parathyroid tablets (gr. 1/10th = gr. 1 fresh gland) orally, twice a day, were then added to the treatment, for any possible effect they might have in assisting the distribution of calcium in the body. This combined treatment—calcium lactate grs. 15, t.i.d.; parathyroid tablets gr. 1/10th, b.d.; cod-liver oil emulsion 2 drachms, b.d., and ultra-violet light twice weekly—was kept up for another three weeks, but no further improvement was produced in the blood. At the end of this time (March 30th) the blood count was :—

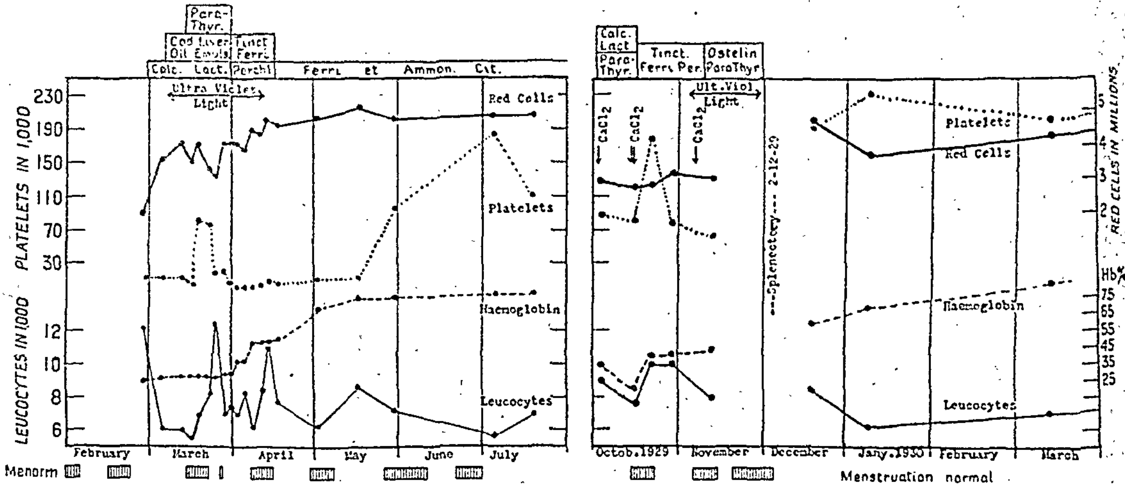

Chart showing effect of various forms of treatment, including splenectomy on Dec. 2nd, 1929.

Red cells, 4,180,000; white cells, 7500; platelets, 9200; Hb, 30 per cent.; C.I., 0·37.

A week after the above combined treatment was started the patient had a distinct relapse. Menstruation set in and persisted for seven days, fresh crops of purpuric spots and more bruises appeared, and the patient's general condition seemed much worse. This relapse, however, was associated with an intercurrent rise in the platelet count. At the onset the platelets shot up to 85,000 per c.mm., but they fell again to 25,000 per c.mm. within nine days and to 9200 per c.mm. three days later.

The cod-liver oil, parathyroid, and calcium lactate were now stopped, but the ultra-violet light was continued twice weekly and tinct. ferri perchlor., ℳ xv., was given orally every six hours for a further two weeks. The hæmoglobin now began to increase in amount and the red cell count improved still more, but the platelets were unaffected. The patient's general condition also improved and, although never absent entirely, new bruises occurred less frequently. Menstruation recurred for six days, the interval from the preceding flow being just over three weeks. At the end of the fortnight's treatment with tinct. ferri perchlor. and ultra-violet light the blood count was as follows :—

Red cells, 4,870,000; white cells, 11,000; platelets, 12,000; Hb, 52 per cent.; C.I., 0·5.

The patient had now had five and a half weeks' treatment with ultra-violet light and no increase in the blood-platelets had occurred. During the first week of the treatment the patient also received orally calcium lactate and cod-liver oil and, notwithstanding the vitamin A of the latter, only the red cells were affected—rising from 3,600,000 per c.mm. to 4,100,000 per c.mm. During the succeeding three weeks, when parathyroid was also administered orally, no further change in the blood took place. Then, at the end of this period, on substituting tinct. ferri perchlor. for the cod-liver oil, calcium and parathyroid, for the first time the hæmoglobin began to rise. It increased from 30 per cent. to 52 per cent. in less than a fortnight and the red cell count improved still further.

It was obvious that the ultra-violet light had produced an increase in the red cell count only, and that iron was needed for the formation of hæmoglobin. The ultra-violet light therapy and tinct. ferri perchlor. were now stopped and the patient was given ferri et ammon. cit. grs. 10, t.i.d., for the succeeding three and a half months. The hæmoglobin increased steadily to 76 per cent., the red cell count remained about normal, but the platelets were practically unaffected until the occurrence of a prolonged (15 days) and severe menorrhagia six weeks after starting the citrate of iron and ammonia. They then shot up to 100,000 per c.mm. Ten days after the cessation of this menorrhagia another attack occurred for about seven days and the platelets then shot up to 185,000 per c.mm., but fell again, two weeks later, to 110,000 per c.mm. Spontaneous subcutaneous bruises had continued to appear from time to time—and occasionally purpuric spots—but nevertheless the patient's general condition was now very good indeed and she left the hospital (see Figure). At the end of her course of treatment with ferri et ammon. cit. the blood count was as follows :—

Red cells, 4,900,000; white cells, 7000; platele 110,000; Hb, 76 per cent.; C.I., 0·76.

FURTHER PROGRESS.

The patient remained in fairly good health for th next seven weeks, and then she had another severe menorrhagia, and felt so ill and faint that she had to go to bed. A fortnight later she was transferred to hospital again under my care. Blood examination at this time (Oct. 3rd) showed :—

Red cells ..	3,000,000	Polymorph. ..	75 %
White cells ..	9,000	Eosin.	1 %
Plat.	92,000	Lymph.	18 %
Hb	35 %	Large mono. ..	6 %
C.I.	0·53		

Red cells poorly stained—many showing marked central pallor. Coagulation time practically normal (Dale and Laidlaw's method).

An intramuscular injection of calcium chloride was administered at once and calcium lactate, grs. 15, t.i.d., and parathyroid tablets, grs. 1/10th, b.d., were given orally for ten days, but the red cells, white cells, hæmoglobin, and platelets decreased further and the patient got much worse. She became very weak and ill, pallor increased, and severe menorrhagia again set in at the end of a week (Oct. 13th). On the day following the onset of the bleeding the blood count was :—

Red cells ..	2,800,000	Polymorph. ..	64 %
White cells ..	7,800	Eosin.	1 %
Plat.	85,000	Lymph.	26 %
Hb	20 %	Large mono. ..	8 %
C.I.	0·32	Mast	1 %

Coagulation time about a half longer than normal.

On this day she was given two intramuscular injections of calcium chloride and put on tinct. ferri perchlor. grs. 15, six-hourly. A week later the vaginal hæmorrhage stopped and the patient had an attack of acute abdominal pain, lasting throughout one night, and aching pain in both legs, especially behind the knees, lasting about a week. On the day following the attack of acute abdominal pain and cessation of the menorrhagia, a blood examination showed that the platelets had shot up to 180,000 per c.mm., but a week later they had fallen to 78,000 per c.mm. On both occasions, however, the coagulation time was practically normal. The two weeks' treatment with tinct. ferri perchlor. alone produced a rise in the hæmoglobin of 20 per cent. (from 20 per cent. to 40 per cent.), but the red cell count was increased only by 400,000 per c.mm. (from 2,800,000 to 3,200,000 per c.mm.). *Ultra-violet light therapy* was then given twice a week and the tinct. ferri perchlor. continued. Two days later (Nov. 6th) menorrhagia again set in and, in spite of an intramuscular injection of calcium chloride, persisted for six and a half days. In the middle of this period of menorrhagia the tinct. ferri perchlor. was stopped and vitamin D, in the form of Ostelin and parathyroid t.i.d., substituted.

The combination of ultra-violet light and ostelin with parathyroid was continued for a fortnight, and at the end of that period the red cells had risen to 3,900,000 per c.mm. and the hæmoglobin to 44 per cent., but the platelets had fallen to 62,000 per c.mm. The coagulation time was normal. The patient's general condition was no better, menorrhagia recurred (Nov. 20th) at an interval of seven and a half days from the previous attack, headache and abdominal pain were troublesome, and fresh petechial spots appeared. She had never been completely free from spontaneous subcutaneous bruises, and at last she agreed to have splenectomy.

SPLENECTOMY.

The operation was performed on Dec. 2nd by my colleague, Prof. A. W. Sheen, and two days later the vaginal hæmorrhage, which had persisted for 14 days, ceased, and recovery from the operation was uneventful. The next examination of the blood was done 16 days after the removal of the spleen (Dec. 18th), and revealed the following :—

Red cells ..	4,630,000	Polymorph. ..	70 %
White cells ..	8,600	Eosin.	1 %
Plat.	192,000	Lymph.	18 %
Hb	60 %	Large mono. ..	10 %
C.I.	0·6	Mast	1 %

Red cells mostly of normal size and shape with fairly good colour. Coagulation time normal.

Three weeks later (Jan. 7th, 1930) the blood examination showed :—

Red cells, 3,500,000 ; white cells, 6200 ; platelets, 32,000 ; Hb, 70 per cent. ; C.I., 0·9. Red cells well [illegible]ned and normal in size and shape. Coagulation time [illegible]mal.

Two months after this (March 12th, 1930) the blood count was :—

Red cells, 4,270,000 ; white cells, 7100 ; platelets, 206,400 ; Hb, 81 per cent. ; C.I., 0·88. Red cells well stained and mostly normal in size and shape.

The patient continued to make satisfactory and uninterrupted progress after the splenectomy. Menstruation became normal, the recurrence of subcutaneous bruises and purpuric spots ceased, and the skin and mucous membranes acquired a good healthy colour. She had three teeth extracted a month after the operation, and there was no excessive bleeding. Five months after the splenectomy (May 1st) the blood count was :—

Red cells, 4,460,000 ; white cells, 7600 ; platelets, 210,000 ; Hb, 90 per cent. ; C.I., 0·9.

The patient was last seen about 17 months after the splenectomy and was very well indeed. There had been no recurrence of any symptoms whatsoever, and menstruation had remained normal (see Figure). The blood count on this date was :—

Red cells, 4,660,000 ; white cells, 8200 ; platelets, 18,000 ; Hb, 96 per cent. ; C.I., 0·96.

SUMMARY.

(1) A case of chronic thrombocytopenic purpura is recorded in which menorrhagia was a special symptom. (2) Ultra-violet light therapy produced no effect on the blood-platelets even when associated with the internal administration of vitamins A and D, in the form of cod-liver oil, and of calcium and parathyroid. (3) The red cell count was increased by ultra-violet light therapy, but no increase in the hæmoglobin content of the blood was produced until the internal administration of iron was begun. (4) Calcium intramuscularly and orally had no effect on the blood-platelets. (5) The disease persisted in spite of all the above forms of treatment, and the administration of liver did not affect it. (6) Splenectomy relieved all the symptoms and cured the disease at once, the blood-platelets rising quickly to, and persisting about, 200,000 per c.mm., and the red cells and hæmoglobin reached normal a little later. (7) Seventeen months after the splenectomy the patient was very well, the blood-platelets were 180,000 per c.mm., and the red cells, white cells, and hæmoglobin had remained normal.

REFERENCES.

1. Proc. Roy. Soc., B, 1922, xciii., 149.
2. Brit. Jour. Exp. Path., 1923, iv., 271.

CLINICAL AND LABORATORY NOTES

INTRALIGAMENTARY ECTOPIC PREGNANCY.

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Three somewhat unusual cases of intraligamentary ectopic pregnancy have recently been treated at the Glasgow Royal Maternity and Women's Hospital. They are worthy of note in so far as they presented some similar and atypical clinical features.

Mrs. A., aged 40, para-5, last pregnancy seven years' previously, was admitted as a case of threatened abortion with a history of slight vaginal hæmorrhage of ten days' duration. Her last menstrual period had been six weeks previously. There had been some degree of menorrhagia before her missed period. Apart from vaginal hæmorrhage she had no other complaint and felt comparatively well. Bimanual examination revealed a retroposed uterus of normal size with a stony mass in the right and anterior fornix. There was no tenderness on examination. A diagnosis of fibromyoma of uterus complicating pregnancy was made and the patient was kept in bed for six weeks. During this time she remained well, but as vaginal hæmorrhage persisted and abortion appeared inevitable, laparotomy for myomectomy or hysterectomy was decided upon. At the operation a right-sided intraligamentary ectopic pregnancy was found and removed along with the tube. The uterus was healthy and lying twisted behind the mass.

Mrs. B., aged 38, para-2, last pregnancy ten years' previously, was admitted as a possibly incomplete abortion. She gave no clear history of having missed a period but complained of irregular hæmorrhage of two months' duration. Apart from vaginal hæmorrhage she had no complaint. Bimanual examination revealed a retroverted uterus of normal size with a hard mass in the right and anterior fornix indefinable from the uterus. No tenderness was elicited. A provisional diagnosis of fibromyoma of uterus or parovarian cyst was made and laparotomy was performed. Again an intraligamentary ectopic pregnancy was found separating the layers of the broad ligament and encroaching on the utero-vesical space, commencing to strip the peritoneum from the bladder.

In these cases the noteworthy features were the entire absence of pain. In neither case was sickness, nausea, or occasional faintness a complaint. No tenderness was elicited upon vaginal examination. The mass was much harder in consistence than might be expected, and apart from vaginal hæmorrhage both patients were healthy and comfortable. The pathological examination of the first specimen showed it to have undergone a mole degeneration. In the second case the sac was intact and complete with fœtus in situ and chorionic villi were embedded in the broad ligament.

The third case was something of a rarity—a patient with an advanced intraligamentary ectopic pregnancy being delivered by operation of a well-developed child weighing 6¼ lb. Here again the clinical picture was unusual.

The patient, aged 44, 3-para, had her last confinement 12 years' previously. She was recommended for admission on account of albuminuria. Her menstrual history was confused but she was quite definite as regards a period of amenorrhœa of eight months' duration. She was so obese and œdematous that it was impossible to make out definite uterine enlargement of fœtal parts. Radiography, however, showed fœtal bones corresponding in size to an eight months' fœtus and the Zondek-Aschheim test was positive. The urine contained albumin (4·12 parts Esbach) and the blood pressure was 150 mm. Hg systolic, 80 mm. diastolic. Despite treatment over 15 days the patient's condition did not improve; in fact, she was growing gradually worse. It was decided to induce labour by means of insertion of a pig's bladder. Under the anæsthetic it was found that the uterus was not enlarged. The passage of a sound confirmed this. No further attempt was made therefore to induce labour.

The patient was operated upon and an advanced intraligamentary ectopic pregnancy was found. The live child was removed and the placenta, which was situated between the layers of the broad ligament, was removed entirely with the sac. There was very little loss of blood. The patient's condition before operation was poor. After operation it became steadily worse and despite blood transfusion and other treatment she died 16 days later. Post-mortem examination confirmed the operative findings and showed peritonitis and chronic nephritis. The child, however, continued to thrive and was discharged a month later.

I wish to thank Dr. R. A. Lennie and Dr. J. Hewitt for permission to publish these cases.

EXCESSIVE SPONTANEOUS INFLATION OF A LUNG CAVITY.

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Ballooning of the lung, a somewhat rare pulmonary condition, was first described by R. Hall[1] as an occasional complication of advanced pulmonary tuberculosis. The condition thus described is one in which the entrance from the bronchus into a lung cavity becomes obstructed in a valve-like manner, presumably with a piece of necrotic tissue, and thus allows the ingress of air during inspiration but prevents the egress during expiration. The cavity being, as it were, pumped up then presses like a balloon on the remaining lung. The symptoms and physical signs produced by this mechanism resemble, in a modified way, those of a spontaneous pneumothorax, to which, in fact, the whole process is very similar. During the inflation of the cavity the walls tend to stretch, and, if they burst, the main and neighbouring cavities break down and enlarge the balloon.

Little interest appears to have been directed to this somewhat rare condition, and I know of no case in which the diagnosis has been confirmed by manometric and radiological examination. The following case, however, suggests that the matter has a practical and therapeutic, as well as an academic, aspect.

A female, aged 21, was admitted to the Massereene Hospital on Feb. 2nd, 1931, as an advanced case of pulmonary tuberculosis. Her history was a typical one, and had lasted for 18 months. During the summer and autumn of the year 1930 she had spent some months in a sanatorium, but had failed to respond adequately to rest. She was further known to have had morbus cordis for some years; mitral stenosis and incompetence, considered to be rheumatic, had been marked for some time, though there had been no obvious evidence of impairment of cardiac efficiency. Tubercle bacilli in large numbers had been found in every recent sputum examination. After admission, she was found to be acutely febrile, with physical signs of infiltration and cavitation in the middle and lower zones on the right side. In view of the extent of toxæmia, it was considered that neither an artificial pneumothorax nor a phrenic evulsion would offer her any material assistance, and no special treatment was undertaken.

On Feb. 18th she developed very severe and distressing pain, fairly consistent in character, on the right side and situated laterally and posteriorly towards the lower costal margin. On examination anteriorly, the percussion note was found to be normal and the breath sounds practically absent on the right side; in spite of the absence of cardiac displacement, first impressions suggested spontaneous pneumothorax. Posterior examination, however, appeared to exclude this, for the percussion note was still definitely dull towards the base, and on auscultation loud cavernous breathing was heard in this region. The pain continued during the next week, until Feb. 25th, and was not fully controlled even by morphia.

On Feb. 25th, finding the physical signs unchanged and suspecting the superinflation of a cavity, I inserted a pneumothorax needle directly through the chest wall posteriorly, in the eighth intercostal space. The manometer indicated a pressure definitely greater than that of the atmosphere, the readings varying with respiration between +4 and +6 cm. of water. The needle, on insertion, was definitely felt to be traversing the several layers of the chest wall, and a further resistance, which would respond to the thickened and necrotic wall of an adherent lung cavity. After the withdrawal of 100 c.cm. of air, the pressure was found to approximate to that of the atmosphere, the manometer readings now varying between +2 and −2. Following the withdrawal of another 100 c.cm., there was found to be no change in the manometer readings, and, concluding that air was entering via the air passages at the same rate that it was being aspirated, the pneumothorax needle was withdrawn. After this procedure there was no marked change in the physical signs, but the pain was found to be somewhat relieved and disappeared within a few hours. The patient continued to go downhill, developed diarrhœa, and finally died on March 30th, without very much comfort and with no recurrence of the pain.

Unfortunately, no radiological examination was possible at the period referred to, though an earlier skiagram, taken elsewhere, in the summer of 1930, which I was courteously allowed to see, showed much infiltration with commencing cavitation in the right lower zone. Unfortunately, again, an autopsy was impossible.

In this case it is clear that there was a ballooning condition of some space in the chest, causing great pain by its pressure on surrounding structures, which was greatly relieved by deflation. It is difficult to exclude the possibility that the needle was really introduced into a localised spontaneous pneumothorax with a thickened visceral pleura, but the following considerations render this unlikely: (*a*) If the pleura had been thickened to such an extent as to cause such impairment of percussion note, adhesions would almost certainly have developed and prevented a pneumothorax of the extent necessary to have accounted for the symptoms. (*b*) The point of the needle definitely felt to be in a large cavity and, further, a large cavity would have been necessary to account for the diminished breath sounds anteriorly; such a large pneumothorax would probably have caused some degree of cardiac displacement. (*c*) The point of the needle, on introduction, definitely felt to be piercing some lung tissue.

In either case it is difficult to account for the loud cavernous breathing heard, but, if dealing with a lung cavity, it might be due either to the continued entrance of air into a nearly contiguous cavity, or to the conduction of sounds directly from the trachea or large bronchi into the stationary air at the end of the

(*Continued at foot of next page.*)

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[1] The Lancet, 1922, i., 61.

BRITISH MEDICAL ASSOCIATION.

ANNUAL MEETING IN EASTBOURNE.

PROCEEDINGS OF THE REPRESENTATIVE BODY.

(Concluded from p. 189.)

AN objection to the report of the Council on the problem of the out-patient was raised by Dr. A. H. MACKLIN for Dundee.

Out-patients in Distressed Areas.

He introduced an amendment stating that, under present conditions, there was a considerable class, especially wives and children of insured persons, who were unable to secure adequate medical attention from their own resources, and for whom the only service obtainable was that of the voluntary hospitals, unless they were to be constrained to apply to the public assistance authorities. In his area, Dr. Macklin said, there was much economic depression, and no public medical or contract services were in force. If the Council's report were put rigidly into operation a large number of persons in Dundee who were out of work would be unable to get any treatment at all. That was to say, they would either be forced to go without treatment, or else they would apply for public assistance. As far as the dependants of the insured persons were concerned, it would be difficult to bring them into any insurance scheme later on if they had once acquired the habit of going on the parish. He thought the report should be more elastic in its application to depressed areas. Contract services were not regarded favourably in Dundee, and could not be accepted as a solution.—He was supported by Dr. G. W. MILLER, also of Dundee, who thought it would be advisable to wait until the dependants of insured persons were included in an insurance scheme before adopting this report. As a temporary measure it was preferable that these people should be treated as out-patients than that they should come under the public assistance officer.—Dr. E. R. FOTHERGILL took exception to the wording of the Dundee amendment, which made no reference to economic conditions, and which implied a reflection on the medical practitioners of Dundee.—Dr. E. H. T. NASH described a scheme applying to women and children which was successfully in force in the Thames valley, and which made medical service available to them at a rate approximate to that of National Health Insurance.

Dr. H. B. BRACKENBURY thought that the Dundee amendment destroyed the whole value of the report. The meeting need not suppose if the report were adopted that it would immediately be rigidly enforced. It would simply constitute a basis, similar to the hospital policy, upon which further progress could be founded. Persuasion and education of hospital authorities would naturally be the first steps, and Dundee need not be alarmed for the immediate future.—On this assurance Dr. MACKLIN consented to withdraw his amendment. After some further discussion of minor points the report was approved by the meeting.

Public Medical Services.

Arising out of the report, a resolution was moved by Dr. A. KEITH GIBSON, for Kensington, to the effect that as a practical contribution to the problem of the out-patient the Association should actively assist in the formation of public medical services wherever these were not already in operation. During the preceding discussions, he said, attention had been called to the difficulties of reducing overcrowding in out-patient departments. At first glance it seemed to be merely a question of achieving agreement between the consultant at the hospital and the general practitioner, but actually the boards of management of hospitals would probably feel dissatisfied if much of the hospital out-patient work were to pass into the hands of the private practitioner. If organisations could be built up on the lines of the public medical services which were now active in several parts of the country, they would offer a sound demonstration to boards of management that adequate care could be provided for this large group of persons outside hospitals. Such medical services had the additional advantage of limiting, in some measure, the encroachments of clinics on private practice. Kensington was aware that the feeling of the Association was by no means unfavourable to contract practice of this kind, but it was hoped that the Representative Meeting would be willing to sanction active assistance on the part of the Association in establishing more public medical services throughout the country.

Dr. BRACKENBURY admitted that the Council was certainly favourably disposed to contract services, and said that the Association had even lent sums of money, on occasion, to further their establishment. But there could be no doubt that, whereas some areas were favourable for the foundation of contract medical services, others appeared to be quite unsuitable, and the Council would not feel justified in undertaking a crusade to establish them in every area.—Dr. J. LOCKHART LIVINGSTONE supported the Kensington motion, but Dr. E. WALLACE HENRY said that, in view of Dr. Brackenbury's remarks, it was scarcely possible for the meeting to pass the resolution; at the same time, however, he felt that it was undesirable that the Representative Body should appear to disapprove of the principle by rejecting the motion. He appealed to Dr. Gibson to withdraw the motion. This Dr. GIBSON did not feel in a position to do, and the meeting agreed to pass to the next business.

Consultant Services in Contract Schemes.

Sir RICHARD LUCE moved a recommendation of the Council—

> That any scheme providing consultant or specialist services for patients of the class such as constitute the members of a contributory or other similar scheme, should include the following principles:—
>
> (1) That where it is desired to provide consultant and specialist services for "contributing" patients defined in para. 42 of the Hospital Policy of the Association, a panel of consultants and specialists should be formed.
>
> (2) That all registered medical practitioners who satisfy one or more of the following criteria should have the right to have their names included on the panel: (*a*) That he has held hospital or other appointments affording special opportunities for acquiring special skill and experience of the kind required for the performance of the service rendered, and has had actual recent practice in performing the service rendered or services of a similar character; or (*b*) that he has had special academic or post-graduate study of a subject

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(Continued from previous page.)

obstructed bronchus, the very small proportion of tissue probably forming the obstruction and the stationary air in the cavity.

On the whole, I consider that this case may be definitely accepted as proving by manometric control the occasional existence of a condition of superinflation of a pulmonary cavity, and that associated symptoms may at times be relieved by aspiration of the contained air. Further, there may not necessarily be a recurrence of the mechanism after deflation.

> which comprises the service rendered, and has had actual recent practice as aforesaid; or (*c*) that he is generally recognised by other practitioners in the area as having special proficiency and experience in a subject which comprises the service rendered.
>
> (3) That the decision as to satisfactory compliance with the criteria for admission to the panel should be vested in a purely professional body upon which the different classes of specialist and consultant are adequately represented, and which would be recognised by the profession as securing impartiality.
>
> (4) That there should be an agreed schedule of reduced fees.

The need for such a motion, he said, depended on the action of the Hospital Saving Association, who were trying to arrange special consultation fees for their patients. The hospitals committee felt that it was not in accord with the principles of the B.M.A. that such special rates should be limited to a group of individuals, members of a particular organisation. They had therefore drawn up the above scheme, which was based on four criteria. First, a panel of consultants should be available; secondly, any medical practitioner should be eligible to serve on that panel provided he fulfilled the requirements stipulated; thirdly, a purely professional body should be responsible for deciding whether applicants met these requirements; and fourthly, service should be given at reduced fees.

Dr. A. GREGORY (Manchester) objected to the word "reduced" as applied to the fees asked, since he considered that it would limit unduly the action of those serving on the panel.—Dr. BRACKENBURY considered that the whole point of the service lay in the fact that it was to be given at reduced fees. If there was to be no reduction there might as well be no service.—Dr. N. E. WATERFIELD (Reading) pointed out that what was a reduced fee for some consultants was not necessarily reduced for others; he thought a fixed schedule was essential, but that there was no need to make any reference to reduction.—This view was shared by Dr. W. F. DEARDEN.—It was agreed that "reduced" should be omitted.

Mr. BISHOP HARMAN suggested that para. (3) of the motion should contain some reference to the machinery by which a practitioner might be removed from the panel, and suggested that the paragraph should be referred back to the Council. Although Sir RICHARD LUCE was ready to accept this proposal, Dr. BRACKENBURY thought it was unnecessary, since these were merely the general criteria, and the consideration of further detail might well be postponed until the Association was contracting with another party to provide such a service.

Views were divided. Sir ROBERT BOLAM felt that, as the motion included certain principles it should be possible to find a form of words to replace para. (3) in which it would be set out in general terms that consultants admitted to the panel should abide by the rules laid down for the service. This, however, proved to be much more difficult than he had supposed, and after prolonged discussion the meeting agreed on the following form of words:—

> That there should be vested in a purely professional body or bodies upon which the different classes of specialists and consultants are adequately represented and which would be recognised by the medical profession as securing impartiality, the decision as to satisfactory compliance with the criteria for admission to the panel, and every applicant for inclusion in such panel shall sign an agreement that if admitted to the panel he will abide by the decision of such professional body or bodies as to his continuance on the panel.

Even so, when this appeared as a substantive proposition, certain fallacies were detected in the amendment by some of the more precise logicians present. It proved to be one of those occasions when everyone was agreed on the substance, but universal satisfaction with its expression was not to be won. The meeting finally adopted the complete recommendation of Council as amended by Dr. GREGORY, with the rider that the Council should be asked to consider Sir Robert Bolam's amendment as a possible substitute for para. (3).

Another motion, introduced by Sir RICHARD LUCE, that the Association would be willing to establish or coöperate in the establishment of a panel of consultants in conformity with the principles of the scheme just adopted, arose, he said, out of the action of the Hospital Saving Association previously mentioned. The establishment of a panel in the metropolitan area was contemplated, but before it wa formed an advisory meeting of consultants would be called to consider the details of the scheme.—The meeting supported this motion.

In moving the remainder of the annual report under hospitals, Sir RICHARD said that a positio had been created by the Road Traffic Act, unde which hospitals may claim from an insurance compan an amount for the maintenance and treatment o injured third parties. The Council had issued i January a letter to the secretaries of medical sta of hospitals, recommending the doctor attending t claim a fee from the hospital in these cases. Th British Hospitals Association had been negotiati with insurance companies for a flat-rate payme and had suggested that the Council should not pr for the payment of the medical staff until th negotiations were concluded. The Council, howev had felt that it was not possible to depart from t terms of the January letter, and it was decided th the two Associations should join in inquiry into t future position of medical staffs of voluntary hospit with regard to financial recognition of their servi During the past year, Sir Richard said, the commi had done everything in its power to further acceptance of the revised hospital policy, and th was evidence that the principles of the policy we being steadily adopted.

A motion was introduced by Dr. D. F. TODD, f Sunderland, proposing that the Council should b asked to consider the question of opposing th establishment of closed panels of consultants and specialists, acting at reduced fees, to societies, and bodies, as being contrary to the ethics of the profession; the meeting supported him.

Commission for Introduction of Patients.

Dr. H. C. BRISTOWE (Bristol) brought forward a motion to state that it was undesirable that the Association, or any body under its control, should seek to obtain a commission from a practitioner for the introduction of a patient to any medical practitioner, whether that patient was to be attended in an institution or home, or simply as a private patient. He considered that no lists should be available of practitioners who were willing to pay a premium for patients, and claimed that a list of the kind existed.—Sir ROBERT BOLAM said that the list in question was published by a reputable body, and contained no mention of any practitioner's name. It consisted simply of information about accommodation for residential patients in various homes superintended by medical men, and was a simple trade arrangement for the convenience of any doctor who wished to place a patient in a residential home under medical supervision.—The meeting supported Sir Robert in his view that no question of ethics was here involved.

Mental Illness.

Dr. **Fothergill** proposed that the Council should be instructed to endeavour to secure the acceptance of the principles affecting private practice in regard to mental illness. There was steady encroachment on private practice, he said, from several aspects. It was owing to the increase in the number of whole-time practitioners at antenatal clinics that the national maternity scheme of the Association had been drawn up and approved. Since the passing of the Mental Treatment Act the Board of Control had implied that it was impossible to treat mental illness on the same lines as physical illness. But a sick mind was not necessarily a diseased mind, and the general practitioner should know how to treat those of his patients who were mentally sick—indeed he was legally required to do so with his insured patients. The Board of Control had stated that the medical student had lamentably little opportunity of seeing mental illness, but this was not necessarily the case. Many universities required their students to attend a three months' course in mental disease. The recent appointments to the Board of Control were not such as to establish confidence in the ability of that body to judge this question. Twenty-three applicants for these appointments from the staffs of mental hospitals had been refused. The general practitioner was in a position to know the environment and characteristics of his patient, and to advise him how best to secure the mental rest which he needed. The Board of Control had suggested that all cases of mental illness must be attended at clinics, which would mean that the general practitioner was robbed of his opportunities to acquire experience. The medical profession had been deprived very largely of midwifery and of the care of sick children, and was now in danger of losing the treatment of early mental cases. One of the principles in the treatment of the mentally sick was to keep all thought of an asylum out of the mind of the patient, yet the Board of Control advocated the care of these patients in villas built in the grounds of mental hospitals. He was earnestly opposed to such an idea, and urged the meeting to endeavour to retain the right of attending the mentally sick.

Dr. R. G. **Gordon** (Bath) admitted that many universities gave a three months' course in mental disease, but he asked whether the meeting would consider training in medicine or surgery adequate if it extended over three months without previous instruction in physiology or pathology. The medical student was given little or no instruction in the functioning of the mind. A preliminary training in psychology should be an essential part of a course in mental disease. He held no particular brief for the Board of Control, but it was a body designed to look after the interests of the patient and to see that he was not confined improperly in a mental hospital. The superintendent of a mental hospital, therefore, was not necessarily the best person to sit on such a board. There was no reason why clinics for mental treatment should be staffed by consultants; in his district the clinic was supervised by the superintendent of the mental hospital, attended by a second practitioner for the care of children and young people, and by a third for the care of adults. Not every general practitioner wished to treat mental cases, which were often extremely troublesome. He agreed with Dr. Fothergill that many mentally sick patients were better treated apart from mental hospitals, but he thought it unlikely that the Board of Control would try to herd them into institutions without regard to individual circumstances. It must be remembered, moreover, that there was considerable abuse of treatment of mental illness in small, privately run homes.

Dr. D. **Rice** (East Norfolk) spoke as the superintendent of a public mental hospital. Exception had been taken in some quarters to the recent appointments to the Board of Control, but the difficulty lay in the fact that the Treasury was not offering salaries which would be attractive to men of high standing in mental work. The three months' course in mental diseases which was attended by the medical student usually consisted of a series of lectures and demonstrations which were sufficient to rouse his interest, perhaps, but which barely touched the fringe of mental disease; nor was there an opportunity of repeating the course during training. Under the Mental Treatment Act the patient admitted to a villa in the grounds of a mental hospital would have a better opportunity for recovery than he could hope for while living in a slum. Dr. Fothergill need not fear that the number of those who would be relegated to asylums would be increased; on the contrary, it was hoped that by extending out-patient treatment the actual number of admissions would be reduced. Attending the clinics there would be those patients who had improved sufficiently to leave the hospital, and whom it was hoped to discharge completely, and patients sent up by general practitioners for consultation. Until recently the mentally sick had been unable to obtain treatment unless they were rich enough to pay for care in expensive nursing homes; it was now hoped that early treatment would be available for every case, and that admission to a mental hospital would be avoided in many cases.

Dr. H. M. **Stratford** (Kensington) agreed with Dr. Fothergill that the best person to treat the mentally sick patient was the private practitioner. Common sense and sympathy were the most important components of the treatment, and the shadow of the mental hospital could not fail to do harm.

Dr. E. H. T. **Nash** moved that the whole question should be referred to the Council for investigation and report.—Dr. **Fothergill** acquiesced in the proposal, and added that he was chiefly anxious that the private practitioner and the patient should be kept in touch with each other. At present the patient could attend a mental clinic without the knowledge of his doctor, which was most unsatisfactory. If it were true that the medical student received inadequate training in mental disease then the standard of instruction must be improved. The medical staff of the mental hospital should supply the consultant service for the general practitioner.

Dr. **Brackenbury** said that while it was true that the training of the medical student was bound to be incomplete in many respects, it was not true to say that those general practitioners who undertook the treatment of mental cases were not properly equipped for the task. The general practitioner was not a universal expert, but he knew when it was inadvisable for him to undertake treatment. Although there were instances where the care of mental cases had been shown to be inadequate, it was only in a few isolated cases that a medical man had been found to be responsible for the neglect. With regard to the Board of Control, the Council took no exception to the appointments, but only to the method by which they had been made. The Board had been approached and a suggestion offered that there should be a wider choice in future. It was agreed that the question should be referred to Council.

National Health Insurance.

A motion by Dr. W. D. Williams, for South West Wales, that a patient, referred to a regional medical officer by his doctor, should not be informed of the origin of his reference, was withdrawn upon the explanation by Dr. H. G. Dain that under the present arrangements such information was not given.

Dr. Stratford (Kensington) moved that local divisions should, where necessary, appoint an insurance subcommittee, by way of stimulating interest.—Dr. Dain supported the motion, which was carried.

Dr. Stratford also moved that all questions involving penalties should be removed from the punitive jurisdiction of the Ministry of Health, and should be decided by a medico-legal tribunal constituted for the purpose; failing the constitution of such a tribunal all decisions involving penalties inflicted by the Minister should be subject to an appeal to the High Court. This, he considered, was a vital principle which should have been insisted upon in 1912. At present the insurance practitioner was in the hands of a government department where the Minister of Health had primitive jurisdiction. There was no appeal from his decisions, and no opportunity for protest.

Dr. E. Stungo (Lambeth) pointed out that the insurance committee provided an intermediary between the practitioner and the Minister of Health. In cases of offence by a practitioner the insurance committee was responsible for the formation of an adjudicating body, the medical service subcommittee, which gave the case an impartial hearing before passing on the conclusions reached to the insurance committee, who then made a recommendation to the Minister.

Dr. D. Clow and Dr. D. Roxburgh opposed the motion, and they were supported by Dr. Dain, who said that the disciplinary mechanism had been considerably modified during the last three years and undertook to satisfy the Kensington division that it was just and effective.—Dr. Stratford withdrew the motion.

A further motion was proposed by Dr. Stratford, for Kensington, to the effect that in view of the charges concerning increased certification which have been levelled against insurance practitioners the Council should give expression to practitioners' opinions in this matter, including as the main causes: more sickness, unemployment, earlier recourse to doctor, and growing appreciation of the services and benefits available.

Dr. Dain said that when the National Health Insurance Act was passed estimates were made on the expectation of sickness based on the extremely inadequate statistics of a men's sickness benefit society. During the war there appeared to be little sickness, because the country was engaged in a great united effort. Since the war sickness benefit had steadily increased, and there was a danger of the insurance funds becoming bankrupt. The blame had been thrown on the doctor, with a charge of careless certification, but the Council were satisfied that depressed economic conditions, a false initial estimate, and an improved standard of service were largely responsible for increased claims. Better diagnosis and more elaborate treatment meant better health in the end, but it also meant more sickness claims. The Council was engaged in considering what was almost a charge from the Government, and were preparing a statement in reply which they hoped to issue in October.

With the permission of the meeting Dr. Stratford agreed to refer this motion to the Council, and with it 27 other motions relating to insurance practice which appeared on the agenda paper in the name of Kensington.

Sweepstakes and Charities.

A vigorous discussion was aroused by the motion introduced by Dr. Ernest Ward (Torquay) that complete discretion should be allowed to branches and divisions in regard to the methods they adopted to assist medical charities. Repeated appeals, Dr. Ward said, were made for medical charities, but results were disappointing. It might be desirable that every member of the Association should contribute half a guinea annually, but in actual practice appeals were a failure. At Torquay dances had been arranged and had yielded from £10 to £15, but when a sweepstake was organised the returns reached £650, out of which £400 had been contributed to the Royal Medical Benevolent Fund, £200 to the Epsom College Fund, and £50 to the divisional medical benevolent fund. The Council had expressed disapproval with this method of obtaining money when the sweepstake was half organised, and had, he estimated, lost £35 for charities by their action. Was a sweepstake, he asked, more immoral than a dance?—And added a quotation from Gibbon in which the moral aspect of dancing was very severely dealt with. All that his Division asked was a benevolent neutrality on the part of the Council, allowing independence of thought and action in the divisions and branches.

Dr. J. Livingston (Barrow-in-Furness) said that good results had been obtained in his area by interviewing all the practitioners and securing a banker's order for an annual subscription of a guinea.—Dr. C. E. S. Flemming thought that it was deplorable that the medical profession should have to resort to dances and sweepstakes to secure that provision for dependents which the working man made as a matter of course, either compulsorily or voluntarily. Sweepstakes gave the contributor a false sense of benevolence, and left him with the feeling that a five-shilling ticket could very well take the place of a guinea subscription.—The Rev. S. D. Bhabi (Greenwich and Deptford) considered that sweepstakes were immoral. He suggested that if every member of the Association who was a smoker set one cigarette aside a day, and bought it back again, the proceeds of the sales would amount to a handsome sum for charity in the year.—Dr. C. J. Marsh (West Dorset) said that following the instruction of his division he was bound to vote against a motion which he would prefer to support, but Dr. G. Mackie (Shropshire and Mid-Wales) thought that the profession was in low water if it had to call upon outsiders to support its charities. He thought a round sum might be raised if each member gave up a week's golf annually.

Dr. Brackenbury put forward the attitude of the Council. They agreed that there should be no interference with the individual, but they thought that as long as there was either a majority or a strong minority who held that a certain method of raising funds was indefensible, the Association should not be officially responsible for the employment of that method, and should not be advertised by individual members as being so.

Dr. F. K. Kerr mentioned a new association of medical practitioners which had been formed in Edinburgh, and which had, he said, arranged a system of group insurance; anyone under 25 who entered might have his life insured for £1000 at the rate of £10 a year.

Dr. W. F. Dearden (Manchester) considered that it was impolitic that the name of the Association should be coupled with anything illegal, however universal, and Dr. D. Clow (Gloucestershire) thought that sweepstakes raised in the name of the Association were not consonant with the dignity of the medical profession, or with that of a body intended primarily for the advancement of medical science.—Sir Robert Bolam agreed that it was undesirable that the name of the Association should be used promiscuously, even though it aided medical charities. It was conceivable, he said, that Dr. Ward might find a market for an improved burglar's jemmy, stamped with the name of the Association, which might provide a lucrative source of funds for medical charities, but it would not be a wholly defensible action.—The meeting proceeded to the next business.

The same subject was raised by Dr. J. S. Manson (Warrington) in connexion with the hospital policy of the Association. Sweepstakes, he said, were admitted to be the purest form of gambling. Viewed lightheartedly gambling was a flight—or flutter—from reality, but regarded more seriously it was a subtle and corrupt vice, a perversion of the normal instinct of adventure. He did not consider that it was dignified that the medical and nursing staff of a hospital should be remunerated from the leavings of a sweepstake.—Mr. Bishop Harman pointed out that the promoters of sweepstakes were not afflicted by a sense of dignity, and thought it would not be satisfactory to introduce anything so imponderable into the hospital policy. He foresaw financial loss from the extension of this method of raising money; in Dublin some of the hospitals which had received large sums through the Irish sweepstake experienced the suspension of their regular contribution from the local authority.—On the suggestion of Dr. Dain the meeting passed to the next business.

The Retiring Chairman.

A vote of thanks to the retiring chairman of the presentative Meeting, Dr. C. O. Hawthorne, was posed by Dr. Agnes Bennett and seconded by r. A. B. Murray. Dr. Hawthorne has completed his third year in the chair, which will be taken next year by Dr. E. K. Le Fleming.

Annual General Meeting.

Prof. A. H. Burgess relinquished the chair at the general meeting to Dr. W. G. Willoughby. Dr. W. Harvey Smith, the President, was unfortunately not able to be present. Dr. Willoughby introduced Lord Dawson of Penn as the President-elect for 1931–32. Lord Dawson said that the Association was looking forward to welcoming members in London for the centenary meeting next year.

JOINT SECTIONS OF SURGERY AND MEDICINE.

At a joint meeting of the two sections, presided over successively by Dr. R. A. Young and Mr. C. A. Joll, Sir Thomas Horder opened a discussion on

Treatment of *Septicæmia.*

Sir Thomas Horder defined the subject for discussion as the general infection of the body by the common pyogenic organisms—the "streptococcal or staphylococcal fever" of Ryle—and included the patient with metastases, even though blood culture might be temporarily negative. He excluded the overflow of organisms into the blood stream in pneumonia and typhoid fever. The history of the former expectant treatment was reviewed, the attempts—mostly unsuccessful—to use antiseptics intravenously, the introduction of bactericidal sera, vaccines, sensitised vaccine, and immuno-transfusions with their disappointing results, and, finally, non-specific "shock" treatment, which is still on trial. Wise expectant measures, said Sir Thomas, are still our main standby. Treatment to be effective should be institutional, and comprises rest, fresh air, food, abundant water, sun (natural or artificial), eliminative measures for bowels and skin, alkalis and glucose to combat acidosis, hæmatinic drugs to control anæmia, nucleic acid and other leucocytic stimulants, hydrotherapy to control pyrexia, proper sleep, relief of pain by local and general means, and, above all, good nursing and a confident helpfulness from the doctor. Bactericidal serums, vaccines and immunogens had all been disappointing. Sensitised vaccines had been used, and also immuno-transfusion, but ten years of trial left them without much credit. Bacteriophages had been commercialised and were under consideration. The immunological factors between host and infecting organism were still generally undetermined. Antitoxic serum offered some hope. *Chemotherapy* had provided many failures and some disasters. Mercurochrome, despite its dangers, had some supporters. Some of the good results claimed from immunotransfusion might be due to the relief of the anæmia, to benefit derived from the donor's blood, or to a form of non-specific protein shock. Any form of non-specific treatment should probably be reserved for the later stages of the disease, and even then adopted with caution. Chemical shock with S.U.P. and other agents had been employed. There were so many things to do which involved no speculation, that this measure was best left to those who understood the teaching upon which the practice was based. The primary focus and later metastases should be searched for daily, and treated by aspiration for preference, or, if this were unsuccessful, by incision and drainage.

Sir Thomas Horder concluded with general advice. Study the individual case; mobilise expectant measures at the earliest possible moment; work in concert with the bacteriologist, but do not take his cue in regard to the programme of treatment; never put all the therapeutic eggs into one basket; steadily persist with the plan of campaign decided upon; avoid panic; do not flog the patient by too many treatments.

PROPHYLAXIS ASPECTS.

Sir William Wheeler referred to the prevention of septicæmia by general surgical technique—e.g., excision and irrigation of severe war wounds. There were weak links in the chain, such as the nursing of septic and clean patients by the same nurse, and the possibility of hæmolytic infections from the throats of unmasked spectators. Serum, collosol, iodone, and salvarsan had been given intravenously but were not highly effective. He had no belief in mercurochrome or gentian violet. Injudicious early interference before a protective cellular barrier had formed round the infection might be highly dangerous. He had seen four patients die of septicæmia after unwise early incision into a septic lip, and death from a pimple on the face infected during shaving. In severe cases the continuous giving of glucose, up to 3 litres a day, given drop by drop into the tissue of the breast or into the saphenous vein, was of great value, as was also open-air treatment.

Prof. D. P. D. Wilkie deprecated premature interference with punctured wounds; if the hand was acutely septic with red lines in the arm, antistreptococcal serum should be given at once and Bier's bandage applied constantly with the pressure adjusted until it relieved pain. This treatment was of value before much cellular change had occurred. He was absolutely sceptical of the value of vaccine, but thought sensitised vaccine might be of use. Glucose, given if necessary, subcutaneously or rectally, was valuable. A localised or "fixation" abscess was of good import. When improvement followed collosols there were always other factors to which one could attribute the success. Before operations on the lower bowel, immunisation with *coli* and staphylococcus vaccine three and ten days in advance, and nucleic acid the night before the operation, were of value.

STREPTOCOCCAL AND STAPHYLOCOCCAL ANTI-SERA.

Dr. **R. A. O'BRIEN** spoke on the utility and limitations of anti-sera, and offered an explanation why the reports of the use of antitoxic sera ranged from "enthusiastically favourable" to "no effect." Okell and Parish, from work with several thousand rabbits, had shown that while the toxin of the hæmolytic streptococcus, given intravenously, would kill rabbits, those given antitoxin withstood the toxin and remained in good health. With culture the story was different; living culture given intravenously also killed, and rabbits protected with 0·25 c.cm. of serum could stand the injection of culture without immediate harm, but if one kept them a fortnight metastases occurred and eventually most of them would die. Clearly then, said Dr. O'Brien, antitoxin protected against the toxin of all hæmolytic streptococci whether derived from scarlet fever, tonsillitis, puerperal fever, or erysipelas, but neither antitoxin nor "antibacterial" serum was effective against metastases. Therefore, antitoxin should be given at the earliest moment, intravenously, and in large doses to combat the early toxæmia of patients which often killed. Antitoxic serum against the staphylococcus had just become available. Its action apparently resembled that of streptococcal antitoxin, for it protected rabbits against a certainly lethal dose of toxin given intravenously; highly promising clinical results had been reported and further experience was desirable.

GENERAL DISCUSSION.

Mr. **N. E. WATERFIELD** had himself suffered from a septic infection of the finger. The same evening he was very ill and the finger was incised during the night and again next morning; the many incisions greatly relieved the pain. With antistreptococcal serum, abundant fluid and nursing out of doors, he made a good recovery.

Dr. **R. KELSON FORD** spoke of unrevealed bacteriæmia, a condition of equilibrium between host and microbe, the disturbance of which resulted in local infection—e.g., tuberculous joints. A woman patient in advanced pregnancy had knocked her knee against a bed; though the skin was unbroken, an inflamed lesion occurred below, and by aspiration a culture of hæmolytic streptococcus was obtained. This, he considered, was an instance of potential "idiopathic" puerperal sepsis. He gave vitamin A freely to pregnant patients; colloidal silver intravenously and milk intramuscularly had proved useful.

Dr. **D. S. SUTHERLAND** used streptococcal antitoxic serum in early puerperal sepsis, for he had had good results in toxic scarlet fever. He had an experience of several hundred cases of puerperal sepsis admitted late to hospital; for these cases he favoured L. Colebrook's mild arsenical treatment, the drug being given intramuscularly to provide slow absorption.

Colonel **R. S. TOWNSEND** had had complete failures with mercurochrome and acriflavine in India, where he had treated at least 50 cases. He favoured antistreptococcal serum and, in early punctured wounds of the finger, Bier's treatment.

Dr. **FLORENCE STONEY** advocated zinc ionisation and diathermy.

Mr. **G. H. STEELE** protested against the curt dismissal of transfusion. He had seen dramatic improvement follow transfusion in a patient gravely ill with so many staphylococci in the blood that they were visible in smear and grew profusely in culture. In another patient with streptococcal blood infection from a septic bone in the leg secondary hæmorrhage had occurred. Improvement after transfusion was immediate.

Mr. **R. V. HUDSON** found abundant fluid, fruit juice, and vitamin A of value. During septicæmia, when effusion occurred into joints or pleura it was unwise to do more than aspirate at first. The fluid teemed with cocci and, therefore, he thought it wise to treat this collection as a "fixation abscess" and aspirate only. Bier's treatment was not always successful. At autopsy, following a witlow, he had found streptococci in the serous fluid of the che and in the thrombosed vein of the arm which had been incised to the elbow.

Mr. **C. A. JOLL** pointed out the importance of keeping a clear judgment. The importunity of friends and the surgeon's own anxiety led him to use many treatments; the last one used got the credit if the patient recovered. He endorsed the value of Bier's treatment, and if he pricked his own fing applied a bandage at once. He had saved a pati desperately ill with osteomyelitis by amputati Transfusion he found of great value, sometim alternated daily with blood-letting. Glucose 10 per cent. solution, and insulin if necessary, w of value.

Dr. **R. A. YOUNG** reviewed the discussion. considered that the laboratory worker had th future of this condition in his hands; he must to find why some cases of septicæmia died in a hours, others lasting weeks or months; these va tions might be related to the peculiar *strains* organism present or to the different response of di ferent patients. He feared too early opening of infected fingers, and had seen death follow injudicious extraction of teeth, particularly from elderly people. In 1918, during the influenza outbreak, he had always begun to hope, even in a desperate pneumonia, when he saw an empyema develop; so in septicæmia he felt more hopeful when a fixation abscess occurred. He would aspirate rather than drain. He had a horror of even small pustules on the upper lip, and had seen disaster follow such infections.

REPLY.

Sir **THOMAS HORDER** agreed with the very early use of serum in liberal dosage. He had seen Bier's treatment relieve the pain in punctured wounds. Morphia also helped in the early stages. Many years ago, during an autopsy on a patient dead from infection with hæmolytic streptococcus, he himself thought he had pricked his finger but could find no hole in the glove, even after filling it with water. Next morning the finger throbbed and he was feverish. By the evening the pain was intense and lymphangeitis was present in the arm. He was relieved when his senior surgical colleague incised the lesion. After many painful surgical procedures he recovered, but the finger was still somewhat crippled. He noted that the serum of which Dr. O'Brien had spoken was antitoxic and could be proved in the laboratory to have a protective action which was lacking in the older antibacterial serum. Transfusion certainly helped to combat anæmia. The good effects which had been recorded might be due to some unknown form of "protein shock." The final conclusion was that one must be wise in general judgment, neglect no useful measure, and be alert to find foci.

SECTION OF PATHOLOGY.

AT the meeting of this section held on July 22nd the chair was taken by the President, Prof. E. P. CATHCART, and Dr. E. F. HOARE opened a discussion on

General Practitioners and Coroners' Post-mortems.

He submitted that the work of coroners' post-mortems was peculiarly work for a skilled and trained pathologist, and that many practitioners did not like having to do it. Even those who were eager for the work had very few chances to gain experience. He declared that the legal fiction of the equality of all practitioners applied only to their legal status and their potential abilities. Their particular superiority in any branch depended on opportunity and experience. The legal aspect and intricacies of the Workmen's Compensation Act and general insurance required constant practice if they were to be fully grasped. In the High Court pathologists were more likely to be regarded as experts and their opinions accepted as "evidence." The whole subject, he said, involved a number of complexes, lay and medical. The public held very varying attitudes towards the post-mortem examination, but the medical complexes surpassed all others in complexity. They were composed of self-interest, high ethical considerations, etiquette, illogicalness, stupidity even, combined with intelligence, decent feeling, and practical common sense; the whole producing in their legal brethren's minds the kaleidoscopic effect of being hit on the back of the head by a charabanc. The coroners' complex had, Dr. Hoare thought, been exaggerated. Doctors were often touchy about trifles, and did not realise that coroners were more often than not their best friends. More doctors ought to qualify for coronerships; the coroner's office was tending more and more to be a medical affair. The extended powers under the Coroners Act, 1926, threw a great responsibility on the coroner. He relied entirely upon the post-mortem report, which was not evidence on oath, and which must therefore be absolutely accurate, informing, and reliable in every detail. A coroner's post-mortem examination was not only held to ascertain the cause of death; the coroner was much more interested in how the deceased came by his death. The cause and the "manner how" were co-related, but were not one and the same thing. Many minor points might indicate the "manner how," as well as affording evidence of identification and of crime. The handling and correct interpretation of morbid changes, and the actual performance of the post mortem in a way satisfactory to the demands of the community, could only be acquired by special training and retained by constant practice. There were not enough cases for everybody to have this practice, and the efficiency of the work would be increased, and the public would be better served, by transferring this branch of medicine to pathologists.

A communication was read from Dr. G. ROCHE LYNCH. He agreed that the conduct of the autopsy and the proper interpretation of results could only be satisfactorily achieved by those who had made pathology their special study, and that accurate and reliable evidence was essential if justice were to be administered. The general practitioner would suffer no deprivation, because the demonstration of a case by a competent pathologist was of much greater value to him than actually performing the post-mortem. The employment of specialists had come to stay.

CASES OF POISONING.

In cases where death was due to some poisonous or noxious substance the material would usually be sent to a public analyst or specialist. The employment of a non-medical analyst seriously embarrassed the work of highly skilled men. The average practitioner might see one case of criminal poisoning or drug abortion in a lifetime. The post-mortem might fail to reveal the cause of death on account of faulty observation or on account of the need for bacteriological, microscopic, or chemical examination. This class of case must be dealt with by the expert pathologist. During the autopsy evidence of poisoning might be found, and here often the medical man was in a difficulty. Only persons of experience could properly reserve material for examination; the inexperienced sometimes made ludicrous mistakes which could have serious consequences. Cases of industrial poisoning might present even greater difficulties; important questions depended on the opinion of the pathologist. For the advancement of toxicology it was essential to have plenty of material for investigation and accurate observation and inference.

Dr. H. W. WEBBER opposed the proposal to centralise post-mortem work. He thought that indolence played a large part in the attitude of the practitioner towards this problem. A general practitioner worthy of the name would undertake all branches of practice, calling on the specialist only for difficult cases. If he had not sufficient knowledge for the work he should set to and acquire it. Post-mortem examinations were the foundation of sound diagnosis. He suggested that a mortuary be established in every city and large area, so that relatives might be spared the unpleasantness of having an autopsy in a private house.

Dr. A. J. HAWES said that, although a general practitioner, he held the view that most general practitioners should not do post-mortems. He declared that they could not do them properly, and could not be expected to do them properly. He regarded the outcry of "more work taken away from the general practitioner" as foolish. If the proper person to do a certain task was a specialist, then the general practitioner ought to cease doing it. The only justification for the general practitioner's existence was that he could do many things as well as other people; an autopsy was not one of those things. The speaker had no sympathy, he said, for the "poor old general practitioner" school of thought. It was true that specialism had captured some of the general practitioner's work, but every advance in knowledge had opened up rich new pastures for him. The general practitioner was shifting ground, not losing it. He had not the special education or the necessary opportunity to become sufficiently experienced in pathology to do this work really well. In every other branch of medicine constant practice was considered indispensable, but the average practitioner only did two or three post-mortems a year. A man who opened a cadaver was in much the same position as the surgeon who opened an abdomen; he ought to be able to deal competently with anything he found inside—easy or difficult. The suggestion that the practitioner should do the work and call in the pathologist when he got into difficulties was not likely to be very welcome to the pathologist. While most general practitioners should not do autopsies, some of them should—preferably younger men who liked the work, in small towns and rural areas where there were no pathologists. Another long-overdue reform was that there should always be an assistant doctor at post mortems, just as there was an assistant surgeon at operations. In country districts it was no light task to find the necessary help. The junior could thus learn the work, as well as being of great assistance to the senior.

Colonel H. A. **Smith** considered that the medical curriculum only fitted a man for the merest preliminaries. It was more important that the general practitioner should be certain of ante-mortem conditions than that he should be able to perform autopsies. The district medical officer in India had to do many post-mortems, and often to face strict cross-examination. A medical witness who gave a straight, honest answer and knew his job would not, however, encounter much trouble with a lawyer.

THE NEED FOR A SPECIALIST.

Prof. A. **Murray Drennan** agreed with Dr. Hoare's conclusions, and said that in his experience practitioners did not want post-mortem work. An autopsy might be a very difficult investigation involving pathological, chemical or histological work, and the life or liberty of an individual might depend on the result. Very important details could easily be overlooked by a doctor who was out of touch with such special points. Even the pathologist needed special experience of medico-legal work. Any medical practitioner could do a post-mortem, but he could only be an expert after special study and long experience.

Dr. P. G. **Stephenson Davis** pleaded that, as a general practitioner was often unable to leave his work to attend a post-mortem, he should as of right be given a fairly full report on the examination of any patient of his who came to autopsy. The coroner in his district—a large London division—had agreed, as an experiment, to answer questions on the cause of death. This, however, was not sufficient.

Dr. W. G. **Barnard** maintained that personal attendance was the best solution, and that a report was not a good substitute. No London coroner or pathologist would have the slightest objection to the presence of the general practitioner at the post mortem. The last speaker did not realise how much the pathologist had to do for his two guineas.

Dr. **Davis** suggested that the practitioner might have a carbon copy of the pathologist's report.

Dr. **Barnard**, continuing, agreed that something of the kind might be done. He considered it dangerous for the general practitioner to carry out a post mortem; often the most important part of the operation was the taking out of the organs, the appearances when they were taken out, and the condition of affairs in situ. An unpractised man might destroy all the evidence and be unable to say, for example, whether the clot was ante-mortem or post-mortem. A medico-legal institute was badly needed in this country.

Dr. A. G. **Shera** stressed the importance of an accurate history and of the presence of a clinicia if possible. The general practitioner ought to receive a fee for supplying an accurate clinical history or for attendance—which might usefully be made compulsory—at the post-mortem.

Dr. H. W. C. **Vines** testified as an examiner that few qualified practitioners could write a post-mortem report. He taught students to open and close the body as well as to examine; the reason why many general practitioners did not like post-mortems was their inability to deal tidily with the body. It was very difficult for a student to do more than two post-mortems during his clerkship.

Dr. A. H. **Hunt** mentioned the trials of medical officers in India who were always expected to state the cause of death. Statistics showing the average proportion of cases in which the cause of death was not apparent would enable them to avoid undeserv blame.

Dr. C. W. **Cunnington** pleaded for coöperati between the general practitioner and the pathologis

Dr. **Hoare** replied.

REVIEWS AND NOTICES OF BOOKS

Gastric Acidity.

A Historical and Experimental Study. By J. D. Robertson, M.D., Assistant Chemical Pathologist to the Middlesex Hospital. London: Published for the Middlesex Hospital Press by John Murray. 1931. Pp. 76. 5*s.*

This monograph contains a scholarly review of the history of gastric analysis and observations on gastric secretion, from the work of van Helmont in the sixteenth century down to the present day. If it be remarked that some very notable observations, such as those of Carlson, have been omitted, it must be noted, on the other side, that a large amount of important experimental work which is usually overlooked, such as that of Spallanzani and Réaumur, is here brought out in its true perspective. Perhaps the chief object of Dr. Robertson's monograph is to demonstrate the significance of the occurrence of lactic acid in the gastric contents, and particularly the diagnostic value of the presence of this substance in cases of suspected carcinoma of the stomach. Much has been written on this subject, and many observations have been based on insufficient evidence, and without the necessary foundation of knowledge of previous experiment, so that Dr. Robertson's critical book should be of value alike to pathologists and clinicians who are interested in gastric analysis.

Dr. Robertson is definitely opposed to the view that lactic acid is produced specifically in carcinoma of the stomach. In a series of experiments, so thorough as to leave little doubt as to their conclusiveness, he finds that whereas lactic acid is usually present in carcinoma of the stomach, it is not an early sign; when this acid makes its appearance, the growth is usually too advanced to be amenable to therapeutic measures. He is convinced that lactic acid is valueless for the purpose of making an exact or quantitative interpretation. The production of this valuable monograph at the low price of 5*s.* does credit to the Middlesex Hospital Press.

The Chemical Activities of Micro-organisms.

By A. J. Kluyver, Professor of Microbiology, Technische Hoogeschool, Delft. University of London Press, Ltd. 1931. Pp. 109. 4*s.* 6*d.*

We welcome the appearance in book form of the lectures given by Dr. Kluyver in London in May, 1930. These lectures, which were greatly appreciated by all who were privileged to hear them, have now been collected into a small volume together with many tables and diagrams, and an excellent list of references. The first lecture deals with alcoholic fermentation, and Dr. Kluyver shows how this apparently amazing process can be reduced to a chain of primary reactions. In his second lecture he goes on to consider other physiologically equivalent fermentation processes, and in the third lecture gives a clear and interesting account of oxido-reduction processes. This is a valuable book.

The Principles and Practice of Perimetry.

Third edition. By LUTHER C. PETER, M.D., &c., Professor of Ophthalmology in the Graduate School of the University of Pennsylvania, &c. Philadelphia: Lea and Febiger. 1931. Pp. 315. With 104 engravings and five coloured plates. $4.50.

THE importance of perimetry, both in ophthalmology ind in neurology, has been increased of late years. Dr. Peter points out that visual acuity in different reas of the field varies not only qualitatively (different reas for different colours), but quantitatively, ecording to the strength of the stimulus. Ferree nd Rand, whose perimeter is specially adapted for cientific work of this kind, have shown that if the ntensity of the red and blue stimuli is properly ncreased, these colours may be recognised as far in he periphery as a white stimulus, whereas green alls far short of the red and blue limits, even if the ighest intensity is used. For the peripheral fields he perimeter—consisting of the arc of a circle, so rranged as to secure ease in central fixation, adequate lumination, and contrast of the test object with the urrounding field—is well adapted, but McHardy's odel, which used to be the most popular, is adversely iticised by the author. He prefers his own or the ter model, but maintains that for accurate work re is nothing to compare with that of Ferree and nd. The central parts of the field—central and aracentral scotomata—can be tested more atisfactorily by Bjerrum's screen, or some similar angent screen, at one or two metres, since the scale n which the observations are taken is larger. Even a small-distance scotometer such as Bishop Harman's, in which the test object is only 33 cm. from the eye, gives better results for central scotomata or enlargement of the blind spot than McHardy's perimeter, since the mechanical registration in the latter necessarily reduces the scale of the chart. Mechanical registration nowadays is not looked upon with favour, for this and other reasons, but though it involves more trouble for the surgeon who is taking the test it also has the advantage that it cheapens considerably the cost of the instrument. In these instruments there is no mechanism for moving the test object, which is moved by the surgeon's hand in whatever direction he likes. In the realm of pure ophthalmology, perimetry is chiefly employed in such diseases as glaucoma, retinitis pigmentosa, arterial obstruction, retrobulbar neuritis, toxic amblyopia, and optic atrophy. For the neurologist the limitation of the visual field is an essential part of the diagnosis in the localisation of cerebral affections which involve the visual path. In these various connexions this book will be of great service. Quite half of it is concerned with the special pathology of fields resulting from affections of the nerve head, the optic nerve proper, the chiasm, and the posterior part of the visual pathway, including the optic radiations and the visual centres in the occipital lobes.

Modern Treatment of Nasal Catarrh.

By A. LOWNDES YATES, M.D. Lond., F.R.C.S. Edin., Assistant Surgeon, Ear and Throat Department, Prince of Wales's Hospital; Assistant Surgeon, Central London Throat, Nose and Ear Hospital. Modern Treatment Series. General editor: F. G. CROOKSHANK, M.D., F.R.C.P. London: Jonathan Cape, Ltd. 1931. Pp. 160. *5s.*

IN this little book Mr. Lowndes Yates describes the course of inflammatory processes within the nose and nasal accessory sinuses, and the reactions of the tissues of these regions to infection. He takes rather novel and unorthodox views of some of these processes, and expresses them dogmatically. Thus he states emphatically that ciliary action is the only method by which the sinuses can empty themselves of secretion, and allows nothing to drainage by gravity or to the currents of air across the ostia produced by blowing the nose. Ciliary action is doubtless of great importance when the mucosa is coated by secretion, but, in a cavity of the shape and size of the maxillary antrum, full or half-full of fluid, it is hardly conceivable that the action of the cilia is sufficiently powerful to lift this bulk of fluid to the ostium. Mr. Lowndes Yates considers it wrong to make a wide permanent opening in the inferior meatus to drain a chronically suppurating antrum, a conclusion which is at variance with the general experience, but relies on frequent syringing by repeated tapping or through a small opening made for the introduction of a cannula. This small opening was in vogue in the early days of rhinology, and was abandoned as unsatisfactory in chronic cases, for it was found that suppuration often recurred after the opening had closed. Mr. Lowndes Yates adopts a rather hopeless attitude towards cases of toxin absorption from a focus of infection in the nose; in his opinion operation should be ruled out in these cases, since they become worse instead of better when extra trauma is added to the existing state of inflammation. There is much value in his insistence on the importance of the function of the cilia, and on the necessity of conserving this as far as possible in all operations on the nose. The book is one of a series intended especially for the general practitioner, but it will be of more interest to rhinologists, to whose thoughts on old problems it may give new direction. It is more concerned with ætiology and diagnosis than with treatment. There is a bibliography at the end of each chapter, the usefulness of which would have been enhanced by references in the text.

Clinical Electrocardiography.

Fifth edition. By Sir THOMAS LEWIS, M.D., F.R.S., D.Sc., F.R.C.P., C.B.E., Physician on the Staff of the Medical Research Council; Physician in charge of Department of Clinical Research, University College Hospital. London: Shaw and Sons, Ltd. 1931. Pp. 128.

THAT there is a continued demand for Sir Thomas Lewis's small book on electrocardiography is shown by the appearance of a fifth edition only three years after its predecessor. The demand is not surprising, for electrocardiography has now an established place in the diagnosis of heart disease and all are expected to be familiar with the ground-work of the subject. This book supplies the information required in an extremely attractive form. A new diagram has been

THE TREATMENT OF SEPTICÆMIA.

THOSE responsible for the choice of a programme at the Eastbourne Meeting of the British Medical Association did well to decide upon a joint discussion on the treatment of septicæmia. Contributors to the discussion were wise enough to limit their remarks to those general infections of the body caused by the streptococcus and the staphylococcus. Sir THOMAS HORDER reviewed the unsuccessful attempts to use antiseptics intravenously, also treatment by sera, vaccines, immuno-transfusion, and finally non-specific "shock" treatment. He pointed out that treatment to be effective should be institutional, and comprises rest, fresh air, food, abundant water and glucose, sun, hydrotherapy, proper sleep, relief from pain, and above all, good nursing. The primary focus and later metastases should be searched for daily, and treated by aspiration or drainage. Many speakers brought out useful points concerning the preventive aspects of septicæmia. Sir WILLIAM WHEELER referred to excision and irrigation of severe war wounds and to weak links in the chain of aseptic technique. He stated his conviction that injudicious early interference, especially with a punctured wound before a protective cellular barrier had formed around it, may be highly dangerous. He had seen four patients die of septicæmia after unwise early incisions of boils round the lips.

Dr. R. A. YOUNG, who presided, feared too early opening of infected fingers, and had seen death follow injudicious extraction of teeth, particularly in elderly people. His horror of even small pustules on the upper lip was well founded, for he had seen disaster follow such infections. Prof. D. P. D. WILKIE has used vaccine treatment as a preventive of septicæmia before operation for excision of the rectum. He attempts immunisation with *coli* and staphylococcus vaccine three and ten days in advance, and gives nucleic acid the night before the operation to stimulate leucocytosis. He uttered a warning against the deep-seated metastatic abscess which often occurs with little or no pain. He deprecated premature interference with punctured wounds and stated his view that if a hand was acutely septic and showed lymphangitis antistreptococcal serum should be given at once and Bier's bandage applied constantly with the pressure adjusted until pain was relieved. Mr. C. A. JOLL and Colonel R. S. TOWNSEND endorsed the value of Bier's treatment, but in Mr. R. V. HUDSON's experience it is by no means always successful. Many speakers spoke highly of the results of blood transfusion, but no particular advantage was claimed for immuno-transfusion. Many experiences of complete failure with mercurochrome and acriflavine were recorded. It was rarely made clear by speakers whether the sera which were claimed to have good effect if used early and in large doses were antibacterial or antitoxic sera. It is doubful whether the audience was clear about the difference between an antibacterial serum produced by the inoculation of an animal with the streptococcus itself and an antitoxic serum produced by the inoculation of the animal with the toxin filtered off from a culture of streptococci. Sir THOMAS HORDER did state definitely that both antibacterial and antitoxic sera had been advocated in the treatment of septicæmia and that the latter offered some hope. Dr. YOUNG, reviewing the discussion, wisely left the future of the treatment of septicæmia in the hands of the laboratory worker whose task it is to explore the reasons for the remarkable variations in reaction to infections.

Dr. R. A. O'BRIEN made an illuminating contribution to the laboratory aspect of the subject. H emphasised the desirability of the early use of concentrated scarlet fever antitoxin, since i protects against the toxin of all hæmolyti streptococci, whether derived from scarlet feve tonsillitis, puerperal fever, or erysipelas. In hi view patients might be saved from the earl toxæmia of septicæmia by giving this antitoxi intravenously in large doses at the earliest possibl moment. He struck a further hopeful note in h statement that antitoxic serum against the staphy lococcus had just become available. C. C. OKEL and H. J. PARISH had shown, he said, from t use of several thousand rabbits, that while the tox of the hæmolytic streptococcus, given intravenousl would kill these animals, those given antitox withstood the toxin and remained in good healt Living culture given intravenously also kill rabbits, but animals protected with 0·25 c.c of serum could stand the injection of culture wit out *immediate harm, though if they* were kep fortnight metastases occurred, and eventually m of them would die. His statement that nei antitoxin nor antibacterial serum was effec against metastases is the probable explanat why reports on the effects of sera range from t *most enthusiastic to the most pessimistic.*

The stories of personal experiences were ente taining. Two speakers praised the early use o serum, and agreed that surgical incision w welcome from the great relief of pain which i brought. It was also interesting to hear ho PFANNENSTIEL, operating upon a pyosalpinx punctured his finger, developed lymphangitis rigors, and delirium, and died in spite of the ministrations of BIER. The fact that PAGET gave morphia a high place in the treatment of his own septicæmia was also illuminating; but must we subsist on impressions and reminiscences? Where are the facts and the figures? Surely our great hospitals can arrange investigations by which the effects of blood transfusion in septicæmia can be appraised statistically. Cannot Bier's hyperæmia for punctured wounds of the finger be put to the test in a given series of cases with controls? Is nobody yet prepared to give figures as to the effect of vitamin A in a long series of cases of septicæmia? Why is it not possible for controlled investigations to be carried out on the relative values of antitoxic and antibacterial sera? Concentrated scarlet fever antitoxin has now been available for many years, and the work of OKELL and PARISH was published as long ago as 1927. We are proud of our medical schools and the methods by which they turn out experienced clinicians, but the next step to progress is surely the endowment of definite lines of research in our great hospitals. We look forward to getting results from such centres as the newly endowed wards and laboratories of Queen Charlotte's Hospital, which should replace haphazard impressions with definite facts.

MATTER.

WE are all now thoroughly accustomed to the revolutionary ideas about the live world of animals and plants which matured during the first half of the nineteenth century, and found popular and convincing expression in the "Origin of Species." Man's place in nature is now recognised everywhere as something quite different from the conception of 100 years ago. LYELL'S argument that the surface of the dead world on which he moves has been moulded to its visible form by slow evolutionary processes has also met with such general acceptance as to be a commonplace. It is difficult indeed for us to look at the world about us with other than evolutionary eyes. But of matter itself no one until recently had any doubts; the substance of the universe might change, might go through many combinations and associations, might present entirely different appearances at one time and another, but everyone believed that it was essentially permanent, incapable either of annihilation or creation. It seems now that this too is in doubt, as Sir JAMES JEANS sets out with his accustomed clarity in a supplement to *Nature* of July 18th.

According to modern conceptions an atom of a chemical element consists of one or more electrons revolving rapidly round a nucleus consisting of one or more protons. The fall of an electron towards the nucleus results in the emission of radiation, and such a degradation of electronic orbits with the resultant annihilation of the atoms involved might be a tremendous source of energy. There have been many speculations as to the precise source of the energy represented by the light and heat coming from the sun and stars. Sir JAMES argues that nothing but the annihilation of matter can account for so much energy coming for such a long time from such relatively small bodies. The difficulty is to account not so much for the intensity of the radiation as for its duration, and astronomical considerations almost all converge to the conclusion that the stars in general have already lived through millions and millions of years. Great interest has been aroused of late by the discovery of the highly penetrating cosmic radiations which reach the earth from space and apparently have no immediate connexion with the stars as they exist. These radiations have just the characters which would result from the annihilation of matter. Produced at extremely high temperatures in the interior of stars this radiation would be continually softened in its passage outwards to free space and would finally emerge in the familiar form of starlight. Produced in the surface layers of stars at lower temperatures or in unattached atoms and molecules in free space, it would reach us largely in its original form as cosmic radiation. These radiations, too, are absorbed with such difficulty that they are relatively indestructible; calculations which we can admire without understanding them show that they would still exist in abundance if they had been produced only in the early years of the existence of the universe. Space, in other words, is permeated by nearly all the cosmic radiation which has been generated since the world began; the rays come to us from the remotest eras of time as well as from the farthest depths of space. There is indeed no knowing whether matter is being annihilated now or not. We cannot produce cosmic rays on earth, and hence it may be presumed that the physics which prevail out in the far depths of space and time are different from our terrestrial physics. The destruction of matter cannot at any rate be going on in our own earth to any great extent, for if it were the world would be much too hot for live things to exist.

So much for the destruction of matter, with which Sir JAMES JEANS is mainly concerned. There is, however, something to be said for its creation by the synthesis of electrons and protons, somewhere in space and under conditions of temperature which may be assumed to be the reverse of those favourable for its destruction. Prof. R. A. MILLIKAN in particular has argued that the cosmic rays arise, at any rate in part, from such syntheses as would be involved in the formation of helium from hydrogen. Some such conception would harmonise with the idea of a universe which has had no beginning and will have no end, and might be taken to represent in the dead world what life, death, and evolution are in the live world. Who can tell?

CONTROL OF ASBESTOS DUST IN INDUSTRY.

DISCLOSURE of the ill-effects exerted on the lungs of workers by asbestos dust[1] raised new problems in improved ventilation for dust suppression in asbestos textile factories. These problems have been surveyed by Home Office inspectors and employers concerned; and a report[2] embodying agreement on the danger points and methods of dust control has just been issued. The document is well illustrated, and sets out clearly the technique required for dealing with the unusual difficulties with which the asbestos trade is faced. At the same time it shows how far methods have improved in recent years for capturing dust at its point of origin and preventing it from escaping into the atmosphere of workplaces. It is unfortunate that explanation of the excellent plates can only be found by hunting through the text of the report. While a practical solution of the asbestos dust problem is here presented, it is noted that considerable time will be needed before the recommendations made can be carried out. Meanwhile, asbestosis must occasionally occur as a cause of occupational fatalities.

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[1] Effects of Asbestos Dust on the Lungs and Dust Suppression in the Asbestos Industry. H.M. Stationery Office. 1930. 1s. 4d.

[2] Methods for Suppressing Dust in Asbestos Textile Factories. H.M. Stationery Office. 1931. 1s.

ANNOTATIONS

THE BRITISH ASSOCIATION CENTENARY MEETING.

In the early part of 1831 Dr. David Brewster, F.R.S., proposed to John Phillips, a geologist, who was then secretary of the Yorkshire Philosophical Society, the establishment of a "British Association of men of science." Phillips enlisted the support of his society, and interested some influential citizens of the town, and on Sept. 26th, 1931, the first meeting of the Association took place in York, 325 members being enrolled. The avowed objects of the Association then laid down have remained unchanged: "To give a stronger impulse and a more systematic direction to scientific inquiry; to promote the intercourse of those who cultivate science in different parts of the British Empire with one another and with foreign philosophers; to obtain more general attention for the objects of science and the removal of any disadvantages of a public kind which impede its progress." The Association holds annual meetings in towns in the United Kingdom or in the dominions. The centenary meeting this year (Sept. 23rd to 30th) will be the first to be held in London. The president will be Lieut.-General J. C. Smuts, F.R.S., supported by the following presidents of sections: Sir J. J. Thomson, F.R.S. (Mathematical and Physical Sciences), Sir H. B. Hartley, F.R.S. (Chemistry), Prof. J. W. Gregory, F.R.S. (Geology), Prof. E. B. Poulton, F.R.S. (Zoology), Sir Halford Mackinder (Geography), Prof. E. Cannan (Economics), Sir J. A. Ewing, F.R.S. (Engineering), Prof. A. R. Radcliffe-Brown (Anthropology), Dr. H. H. Dale, Sec. R.S. (Physiology), Dr. C. S. Myers, F.R.S. (Psychology), Prof. T. G. Hill (Botany), Sir C. Grant Robertson (Education), Sir John Russell, F.R.S. (Agriculture).

The addresses and discussions of direct interest to medical men will include the presidential addresses by Dr. Dale on the Biological Nature of Filtrable Viruses, and by Dr. Myers on the Nature of Mind; also the discussions on the physiological basis of sensation, biological experiments on man, resuscitation, social and industrial psychology, and the psychology of mental defect. The reception room will be at the Imperial Institute, South Kensington, and the sectional meetings will be held in various departments of the Imperial College of Science and Technology, at the Natural History and Victoria and Albert Museums, and at the house of the Royal Geographical Society at Kensington Gore. To mark the occasion of its centenary the Association is seeking to raise an endowment fund of £40,000. Contributions to the fund and all correspondence relating to the meeting should be addressed to the Secretary of the Association at Burlington House, London, W.

THE MECHANISED STUDENT.

Time was when the medical student, finding in his ward a new patient, sat by that patient's bed with a blank sheet of paper and wrote thereon such facts as seemed to him to be relevant out of the conversation they held. The subsequent criticisms of his chief taught him how to select and how to express what he had selected. In this country we have not got so very far from that to-day, but American methods of standardisation are creeping towards us, and those who have seen the immense dossier allotted to each patient in clinics run on the American method will be interested to hear that one of the originators of the systematised clinical record has already become alarmed at the growth of his own child. Dr. Eugene S. Kilgore[1] begs his countrymen to call a halt and make the technique of history-taking an intellectual rather than a mechanical process. Histories, he says, should exhibit uniform "clue-mindedness" rather than a uniform system of headings and paragraphs. He cites as an instance a Jewess, aged 45, whom he saw recently in a teaching hospital. Five minutes' conversation elicited the facts that her husband had died a year before, that she had then looked for support from her eldest son but had gradually realised that his talents were limited to the selling of newspapers, and she had therefore taken employment at washing dishes in a restaurant for eight hours a day, in addition to her home duties. She had the inevitable result: backache, insomnia, anorexia, exhaustion, and loss of weight. Her neat aluminium folder contained five and a half closely written pages of writing divided into 28 captions, all neatly underlined with red ink and ruler. The half-dozen really important items in her story were scattered far apart from each other under such headings as "soci condition," "occupation," and "marital history, with shortness of breath under "cardio-respirator system" and flatulence under "gastro-intestinal. Dr. Kilgore rightly declares that his student cou have made a better history before he ever set fo in a medical school. He suggests that the attem to amplify records for future statistical research should be abandoned in ordinary teaching hospital it would be enough if it were maintained for spec purposes in institutions where there is a reasona possibility that the data will be suitable for use a will be used. He suggests that students should taught to consider content rather than form and follow out significant clues with exhaustive thorou ness. They will not overlook any more importa data under the régime of free composition than th do under the régime of conventional paragraph British physicians have never cared for the mecha sation of their clinical scouts; they are likely remain content with the intelligent amplification four or five main headings.

VASCULAR PERISTALSIS.

Just before the war certain German physiologists claimed to have demonstrated electrical changes in arteries, which they held to be indicative of active contraction of the muscular coat. Blumenfeld, however, discredited this interpretation by showing that these changes in electrical potential could be explained on a purely physical basis as the result of the pulse-wave throwing a mass of blood against the wall of the vessel. R. M. Wilson,[2] on theoretical grounds and from a reconsideration of arterial pulse tracings, postulated an active arterial peristalsis. This view met with very little acceptance, and it is difficult to conceive of a peristaltic wave which could travel at the same rate as the pulse, while if it did not do so a pulse tracing should show two different and asynchronous waves. Now, however, A. Luisada[3] has reinvestigated the question from the aspect of changes in electrical potential along the course of the vessel. By means of high amplification he has been able to demonstrate diphasic followed by monophasic currents in the arteries of animals with each pulse-wave. He has repeated these observations on human subjects with the same results, and claims that these changes are evidence of muscular contraction, since control experiments on dead arteries and elastic tubes were absolutely negative. This work suggests that each pulse-wave is the stimulus to an active contraction of the arterial wall. In veins, also, he found electrical changes, but here of such large amplitude that it was possible to record them without amplification. The feature of these "venous electrograms" is the fact that the "contractions" are wholly irregular and cease after occlusion of the proximal end of the vein. Whatever may be the correct interpretation of these findings they form an interesting contribution to the discussion whether or not an active rôle should be ascribed to the arteries and veins.

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[1] Jour. Amer. Med. Assoc., 1931, xcvii., 93.

[2] The Hearts of Man, London, 1918.

[3] Arch. des Mal. de Cœur, May 1931, p. 305.

SYMPATHETIC GANGLION LESIONS IN SCLERODERMA.

The ætiology of scleroderma is still much disputed, but facts are accumulating to support the view that implication of the sympathetic nervous system is associated with, or possibly the cause of, the disease. Geoffrey Blake describes a case[1] of a woman 30, who had attended hospital in 1919 for symptoms pointing to Raynaud's disease. This is not remarkable, since in the earlier stages of the sclerosing condition the extremities are often blue and cold, and the finger tips and nail beds may present atrophic changes. She was not seen again until 1923, when the skin changes had progressed and were recognised for what they really were, scleroderma with some degree of oderma, and the emaciation often associated with this condition. There were, in addition, symptoms relating to spasm of the œsophagus, confirmed by X ray examination. In July, 1929, X ray examination revealed obstruction at the pylorus, with dilatation of both the large and small intestines with almost complete obstruction of the descending colon. Ileosigmoidostomy was performed, but diarrhœa and vomiting were not relieved, and a cæcostomy was felt to be imperative. But the symptoms were not relieved, and the patient died on Sept. 22nd, 1929. At the autopsy, 12 hours later, sections were made of the skin and of portions of the endocrine glands. The changes due to scleroderma, which had been confirmed by a biopsy of the skin during the patient's lifetime, were again demonstrated. These included loss and atrophy of the papillæ, excessive pigment in the rete, dense sclerotic tissue in the dermis, with secondary atrophy of the cutaneous appendages. There were no definite microscopic abnormalities in any of the endocrine glands. The whole large intestine showed an abnormal degree of dilatation, which was so pronounced as to mask hypertrophy of moderate type. Of great interest and importance—especially if they are confirmed by reports on other autopsies—are the changes described in microscopic sections of the lower cervical sympathetic ganglion. The ganglion cells are said to be fewer than normal, many show striking changes. Some are enlarged and pale and show marked loss of finer structure; they appear to be "blown up." Others are small and shrunken, and stain deeply. Such changes have not been found in a series of controls taken at the same time after death. Other observers have sought in vain for such changes in the nervous system, although symptoms such as facial hemiatrophy and trophoneuroses, and the not-infrequent zonal distribution of sclerodermic plaques, would tend to support the association between scleroderma and lesions in the sympathetic nervous system. That Raynaud's syndrome is likely to be due to disease of this system would seem to follow from the results of arterial sympathectomy, and the clinical resemblances between scleroderma and Raynaud's disease in their early stages adds weight to the possibility of a common ætiology.

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[1] Bull. Johns Hopkins Hosp., April, 1931, pp. 212–227.

LEGUMINOUS CROPS AND MALARIA.

Prof. Hans Ziemann,[1] of Berlin, notes that under apparently similar physical conditions, and with similar mosquito prevalence, the amount of malaria may be surprisingly different. D'Herelle informs him that he noticed in the Argentine, 20 years ago, that leguminosæ grew about the streams and swamps in the malaria-free districts, but not in those where there was malaria. He observes that malaria disappeared from some islands of Holland in 1880, when clover from the south of France was sown there, and he agrees with Sir William Willcocks in ascribing the freedom of most of Egypt from malaria to the growth of wild clover, which is absent in the Suez canal zone, in Palestine, and in Greece, where the infection is prevalent. D'Herelle ascribes the influence of these leguminosæ to the coumarin contained in their blossoms, which appear in the malarial (summer and autumn) season. Ziemann also quotes Krysto, of the Russian Agricultural Department, writing in the *Scientific American* for April, who says that 35 years ago, when he lived in the Caucasus, everyone in his valley had malaria except the four who had planted beans and lucerne around their houses; he has seen the same in the Southern States and in Argentina, where malaria disappeared when lucerne was sown, though mosquitoes persisted as before. It is suggested that when the female mosquito sucks juice from these flowers she is either cured of her infection (as a man by quinine), or the gametes are sterilised. These questions have yet to be studied, and Prof. Ziemann calls for experiment. He gives a list of some 80 coumarin-containing plants and invites people living in a malarial district to choose those that will suit the climate, remembering they must flower throughout the worst season of infection.

SPEECH AND VOICE.[2]

In spite of numerous painstaking researches our knowledge of the exact mechanism by which the sounds of speech are produced is still very inexact. Especially is this the case for the production of the vowel-sounds which, although the variations of movement involved are probably very minute, are easily detected by the ear. The differences of voice quality present a similar problem; here personal quality and family resemblances are very definite, so as readily to be recognised even over the telephone, and probably depend on very small differences in the shape and structure of the producing cavities. Sir

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[1] Arch. f. Schiffs- u. Tropen-Hygiene, July, 1931, p. 410.

[2] Speech and Voice, with X Rays of English, French, German, Italian, Spanish, Soprano, Tenor, and Baritone Subjects. By G. Oscar Russell, Ph.D., Director of Phonetics, Laboratories and Speech Clinic, Ohio State University. New York: The Macmillan Company. 1931. Pp. 250. 17s.

Richard Paget, whose work was reviewed in these columns a little over a year ago,[3] made extensive experiments with models to show that the vowel-sounds are musical tones of definite pitch, each associated with a pair of resonators formed by the throat and mouth. Mr. G. O. Russell does not believe that "cavity tone" supplies the entire solution of the problem, but thinks that the character of the surfaces and walls of the vocal cavities may be quite as important. He has evolved a method of showing the shape of the mouth and throat cavities, during speaking and singing, by means of X ray photographs, using a marker to fix the median sagittal plane. The technique is not exactly described, but a specially prepared thread is swallowed, which adheres to the mid-line of the tongue. It is difficult to see how the mid-line can be marked out in this way for other parts of the cavity. On the numerous pictures given in the text the cavities have been marked out in white, which makes them easier to read, but which also necessarily raises some little element of doubt. Mr. Russell also employs a "laryngoperiscope" of his own design, which enables the interior of the larynx to be examined during phonation, and he provides some interesting photographs taken by this means; a description and illustration of the instrument would be of interest. His X ray studies comprise over 400 subjects and 3000 experiments; this large mass of material has not yet been thoroughly digested, and the conclusions reached cannot be considered final. He believes that the X ray pictures of the mouth and throat positions during production of the different vowels will be of value, not only for the instruction of singers and in the pronunciation of foreign languages, but in the teaching of deaf-mutes.

THE B.M.A. AT EASTBOURNE.

THE members of the British Medical Association were fortunate in having three days of anticyclonic weather between two periods of rain and cold. The visitors, who took advantage of the many motor tours provided for them, saw Sussex at its very best—poppies, thistles, rampion, and cornflower blazed in the cultivated patches and a multitude of what Hudson called the "fairy flora of the downs" chequered the "wise turf" of Beachy Head and the Seven Sisters. Brilliant sunshine favoured the Civic Garden-party in the beautiful grounds of Folkington Manor on Thursday afternoon, and Devonshire Park provided a handsome setting for the evening receptions. Over 1100 members and guests attended the President's reception on Tuesday evening, and nearly as many were to be seen at the Civic Receptions on the two subsequent evenings and at the Marquess of Hartington's ball on Friday night. The annual general meeting was held in the Town Hall, where members robed for the procession to St. Saviour's Church for the official religious service. The sermon was preached by the Bishop of Chichester, and the service was preceded by a brief ceremony of remembrance at the war memorial. An attraction to many visitors was the county cricket match, Somerset *v.* Sussex, which was conveniently timed to take place on the three days of the meeting, while golf competitions and tennis tournaments were available for the strenuous. Medical missionary, and temperance breakfasts were held as usual, and, in addition, a Rotary luncheon, an Irish graduates' luncheon, a Masonic meeting, and a secretaries' dinner claimed attendance from those suitably qualified. The popular lecture was delivered by Prof. F. T. G. Hobday on Some Diseases of Animals Communicable to Man. The lecturer laid special stress on the regrettable existence of tuberculous milk and the chaotic state of the present regulations governing milk-production and sale in this country. Some interesting films were shown. The first was a record of the Canadian meeting last year; the second was a "talkie" depicting lower segment Cæsarean section as performed under local anæsthesia by Dr. J. B. De Lee at the Chicago Lying-In Hospital. Dr. R. G. Canti showed to enthusiastic audiences his latest moving pictures of microscopic life, and Petrolagar Laboratories showed a series of films illustrating intestinal movements in animals. A party of 100 people was entertained to a tour of the Level, dinner, and a concert by th Hastings Division and Corporation on T afternoon and evening, and other parties neighbouring medical institutions.

RIVER POLLUTION—THE TEES SURV

How is it that some rivers manage of the to purify the polluting liquids they receive? quantities of different effluents can these rivers with without destroying the conditions of purification? Faced with such questions as the Water Pollution Research Board dec examine a typical river flowing through an ind area. It chose the Tees, which, in the 12 miles b Stockton and the sea, takes not only the effl many factories, but also the untreated sew Thornaby, Stockton, Middlesbrough, and Pillin. A Tees Survey Committee began work in April, and the first instalment of information is now lished.[1] It deals with the hydrography of the river; complementary studies of the biological chemical aspects will take another three years complete. Meanwhile the Ministry of Agricul and Fisheries is examining the non-tidal reaches.

One important result of the hydrographical sur is our definite knowledge of the movement of curr at different depths. At most of the observing statio the flood was found to run strongest at a depth bel 1 fathom; the ebb, without exception, was strong on the surface. From the surface to a depth 1 fathom the current ebbs longer than it floods. Belo 2 fathoms the flood runs for 6½ hours or longer, and t ebb is less than 6 hours. The maximum speed of t flood is at 1 or 2 fathoms' depth, and not at t bottom, where friction against the river-bed reta the flow. We have to reckon with the different dens of fresh and salt water. We find the flood runni up-stream in the deeper layers, while the ebb is st running out on the surface. Thus the broad inferen appears that polluted matter will not readily esca seawards unless it is in the surface layer. It important, therefore, though apparently not eas to obtain accurate measurements of the thickness the upper layer. Useful evidence of silting, explicab with better knowledge of the depth of the river-be and the strength of the current, is available from th experience of the Tees Conservancy dredging opera tions. Indeed, the coöperation of local interests in th survey is a hopeful sign. When all the results of th inquiry are published and coördinated, there shoul be much to learn. In a preface to the report of th hydrographical survey, Mr. H. T. Calvert, D.Sc., th

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[3] THE LANCET, 1930, i., 1074.

[1] Water Pollution Research: *Technical Paper No. 2. Surve of the River Tees. Part I.—Hydrographical.* Published b H.M. Stationery Office. 5*s.* 6*d.* net.

Director of Water Pollution Research, can fairly claim that this pioneer work, with its apparatus of tables and diagrams, will be a useful precedent and pattern for similar investigations elsewhere.

LORD KNUTSFORD.

THE announcement of the death last Monday of Lord Knutsford has been received with deep regret by the medical profession, who recognised in him a life-long and tireless worker in the cause of the sick poor. A pioneer in the service of the voluntary hospitals, who lived to be a veteran in that service, his enthusiasm never faltered, his courage never wavered, and his dogmatism had the justification of unrivalled experience. Forty years ago, when a director of a London dock company, he visited an injured labourer in the Poplar Hospital, and the sequel of his errand of mercy forms an apt illustration of his character. His senses having convinced him that the building was obsolete and the management deplorable, he took immediate charge, unsupported by the managing committee, raised the money urgently required to render the structure sanitary, started new buildings, and a new administration.

LORD KNUTSFORD.
[Photograph by G. C. Beresford

His practical success in the smaller place led to an invitation which 30 years ago brought him to the assistance of the London Hospital. He was placed on the committee of management, and submitted, almost on the spot, to that body a report on the existing condition of affairs, with the result that the sitting chairman resigned and Sydney Holland, as he then was, took his place with the avowed object of introducing drastic reforms. What has happened to the institution during the last 30 years is known to everyone. Great things were done and great men adorned the staff of the hospital before the era of change, but the work was carried on in conditions that to-day would seem incredible, and even at the time were recognised as faulty. The growing need for laboratories had not been met; operating surgeons were hampered by lack of facilities at the very time when the discoveries of Lister were making the fields of operation almost infinitely larger; while accommodation for nurses was almost absent. To-day, under Lord Knutsford's chairmanship, the hospital, while housing some 30 per cent. more patients, is a model centre of healing in all its branches, is fully furnished with laboratories, has a fine college affiliated to it, and a famous training institution for nurses. The vast expenditure of public money thus implied was made possible by Lord Knutsford's extraordinary power of extracting money. In his numerous appeals he was forcible, pathetic, and witty by turns, or a very effective blend of all three. While he argued or persuaded with recurring success large groups of the public to aid the London Hospital, he was also particularly fortunate in his attacks upon individual purses. This was well revealed in an amusing book, "The Prince of Beggars," written by one of his former private secretaries, in which Lord Knutsford's methods of securing subscriptions and donations to "the London" were recorded.

Lord Knutsford had made a particular study of the nursing question, and had been successful in introducing drastic reforms at the London Hospital. Inevitably he found it difficult to believe, without statistical evidence, that a shortage of candidates could exist sufficient to justify the setting up of a commission of inquiry by THE LANCET. He narrated his views on the subject to the Editor of THE LANCET in frank letters and in more than one conversation. At his own institution, he said, there was no shortage of nurses and no criticism of the conditions of service in hospitals had reached him. It was characteristic of him that, although he remained unconvinced of any need for the inquiry, he gave us his personal assistance in supplying answers to the questionaire, the document being preceded by an ironical blessing of his friend, the chairman, and the statement that it had taken more than five hours to fill up.

While work at "the London" employed most of Lord Knutsford's time and energy, he was always to be found as a public champion in the cause of progressive medicine, as was fitting in the grandson of that great physician Henry Holland. He took many opportunities in the House of Lords of recording the debt owed by humanity to the scientific discoveries of medicine, and one of his last public appearances must have been at the annual meeting of the Research Defence Society over which he presided. Not only the voluntary hospitals but all those connected with the advance of medicine will mourn his loss, while men and women placed in every status of society will feel the loss of his genial and forceful friendship.

CHEMICAL SPERMICIDES.

THE July number of the *Journal of Hygiene* contains the third of a series of papers by Mr. J. R. Baker, D.Phil., in which he reports on a long programme of experiments[1] upon the spermicidal power of chemical contraceptives conducted by him in the department of zoology and comparative anatomy at Oxford. These experiments are not yet complete, and it would be premature to regard any of the findings so far published as affording guidance as to which chemical substance or which proprietary product is most satisfactory from the clinical point of view. At the same time there is good reason for supposing that when the series of tests is complete there will be placed at the disposal of the medical profession a spermicidal pessary considerably more effective than any now in use.

The present paper describes a careful comparison of the effects upon guinea-pig and human sperm of several of the contraceptive suppositories and foaming tablets now on the market. An attempt is made to evaluate the relative spermicidal rôles of the foaming substances contained in these articles as against the ingredients which act by purely chemical means. It is further shown that the cocoa-butter base, in which quinine and chinosol are often incorporated, exerts a neutralising effect upon these substances. Thus grs. 5 (0·324 g.) of finely powdered quinine bisulphate or grs. 3 (0·195 g.) of chinosol, which are the quantities contained in a vaginal pessary, will completely immobilise spermatozoa in a quarter of an hour. The same quantities of the same substances, when incorporated in a cocoa-butter base, have no appreciable effect in a much longer period. From these results, however, it is not to be concluded that the contraceptive value of pessaries, consisting of quinine or chinosol in cocoa-butter, is negligible. There is now available in unanalysed form a considerable body of evidence that many women have successfully spaced their pregnancies by using these pessaries alone. There is therefore a strong implication that the cocoa-butter may exert a contraceptive effect by covering the cervix with a thin film which impedes the ingress of spermatozoa. This mechanical action is acknowledged as an important clinical factor by Dr. Baker, who clearly realises that his experiments take no account of it.

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[1] See also THE LANCET, 1930, i., 366.

Research in the direction of improving contraceptive methods may take two directions. In the first place, it is necessary to ascertain the comparative contraceptive value of different vehicles, whose action is purely mechanical; in the second place the comparative spermicidal power of chemical substances must be determined. Dr. Baker's investigation of the second group of problems has already exploded a highly misleading fallacy. He has shown that the assumption made by certain manufacturers that because a substance is a good germicide it is also a good spermicide is erroneous. Thus, sodium dichlorylsulphamidbenzoate, the chief ingredient of one of the most widely advertised foaming tablets, was found by him to have the lowest spermicidal power of any of the chemical substances he has examined. When the parallel investigations of vehicles and spermicides are complete, it will be necessary to combine the most effective of these in such a way that the chemical activity of the spermicide is little or not at all impaired by the vehicle. The next step will be to ascertain the minimum concentration of the spermicide which is capable of producing vaginal or uterine injury in animals; and, if possible, to assure ourselves that the combination cannot damage the sperm in such a way as to lead to the production of defective individuals in later generations. These researches are now being carried out.

THE LIGHTING OF SCHOOLS AND LIBRARIES.

THE Council of the Illuminating Engineering Society has published the reports of three subcommittees dealing with the lighting of schools and libraries.[1] A report on library lighting was published in the *Illuminating Engineer* for July 13th, 1913, and the present report brings that up to date. The chief requirements of a library are sufficient illumination, together with the avoidance of dazzle, glare, and shadow. The ceilings and walls should be finished in a light colour, as they then add diffused light, and soften shadows and contrasts. Polished and glossy surfaces should be avoided. No unshaded lamp-filament or gas-mantle should be visible at any angle to persons reading at the tables, and the shades on stand lamps or table lamps should be opaque or of very low surface brightness. For general illumination of the room the lighting should be not less than one foot-candle and the illumination on the tables from all sources not less than five foot-candles. If supplementary lighting is needed for newspaper stands, it is conveniently supplied by tubular lamps in trough reflectors, slightly above and about a foot in front of the top line of the stand, giving a well-diffused source of light.

The first report on the lighting of schools is a revision of that issued in the same journal in July, 1914, and deals with daylight. It takes as the minimum standard of adequate light for ordinary purposes 0·4 per cent. sill-ratio or 0·2 per cent. daylight-factor. It recommends that every child should have a view of the sky from its desk and that the area of sky visible should be sufficient to afford an illumination on a horizontal plane at desk or table height equivalent to a daylight factor of 0·5 per cent. of the illumination from a complete hemisphere of sky, all parts of which are equally bright. Windows should preferably be on the left of the pupils, and any windows on the right should be designed for cross ventilation only, or for the admission of sunlight to the room when pupils are out. Roof lighting is undesirable, and windows facing the pupil are highly objectionable. Window-heads should be horizontal, and the glass should be carried up unobstructed if possible to ceiling level. The ceiling should be white, and the walls light in colour, while desks and furniture should be light and unobtrusive.

Another committee reports on the artificial lighting of schools,[2] and recommends that the illumination of desks and tables should be five foot-candles fo ordinary work and eight foot-candles for special work. For assembly and recreation rooms three foot-candle is considered sufficient, and the general illuminatio should nowhere be less than one foot-candle. O blackboards the light should be 60 per cent. in exces of that on desks or tables. Great importance i attached to the avoidance of glare, and it is recommended that no incandescent or bright reflecti surface should be visible to the eyes of teacher o pupils at work and no source of light—unl completely screened—should be below a line dra from a point on the back wall 3 ft. 6 in. above th floor to a point 4 ft. above the upper edge of th blackboard surface. Blackboards should be mai tained in a dark and matt condition, and books shou be printed, as far as possible, on matt pap Objectionable shadows are to be avoided by obtain light from diffusing media and keeping the walls a ceilings light. Lights on stairways must be place that each flight is illuminated from above and bel and shadows of risers on the treads are avoided. classrooms four lamps not less than 10 ft. above t desks are convenient, but additional units may necessary for the blackboard and the teacher.

MEDICAL RESEARCH COUNCIL.

Lord Dawson of Penn, President of the Roya College of Physicians of London, and Dr. Edwar Mellanby, F.R.S., professor of pharmacology in the University of Sheffield, have been appointed member of the Medical Research Council in succession to Prof. T. R. Elliott and Prof. J. B. Leathes, who retire in rotation on Sept. 30th.

INDEX TO "THE LANCET,"
VOL. I., 1931.

THE Index and Title-page to Vol. I., 1931, which was completed with the issue of June 27th, is now ready. A copy will be sent gratis to subscribers on receipt of a post-card addressed to the Manager of THE LANCET, 7, Adam-street, Adelphi, W.C.2. Subscribers who have not already indicated their desire to receive Indexes regularly as published should do so now.

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[1] Copies can be obtained on application to the Hon. Secretary, Mr. J. S. Dow, 32, Victoria-street, S.W.1.

[2] See also THE LANCET, 1929, i., 243, and 1930, i., 475.

SPECIAL ARTICLES

THE PROGRESS OF WORK ON CALMETTE'S B·C G VACCINE.

CALMETTE has given a general review of the progress of B C G work in France and in other countries in his report to the Seventh International Conference against Tuberculosis, held at Oslo, 1930.[1] At a meeting of the Section for the Study of Disease in Children of the Royal Society of Medicine, held on June 9th, 1931, he described the experimental and clinical results which he had obtained (vide *The Lancet*, 1931, i., 1298, and the *British Medical Journal*, 1931, i., 1070).

The number of infants immunised with B C G in France during the period July 1st, 1924, to May 1st, 1931, a period of over 5½ years, exceeds 336,000, and there are now more than a million vaccinated children in the world. Calmette states that between the age of one month and the end of the fourth year the mortality in France from tuberculosis of children born of tuberculous mothers or brought up in a tuberculous environment, is 15·9 per cent., while it is only 3·4 per cent. for children in this age-period who have been vaccinated with B C G. The treatment is not designed to produce a permanent immunity, but to give sufficient resistance to the child to carry it through a dangerous period of life and to enable it to go through the usual course of natural immunisation to tuberculosis by repeated small infections without the risk of such infections becoming progressive. In other words, the immunising value of B C G is transient.

Calmette and his associates are emphatic that [illegible] is an efficacious prophylactic agent against tuberculosis, and that its use is innocuous. They do not deny that the organism is capable of producing lesions in the animal body, but they claim that such lesions are entirely benign and incapable of developing into active centres of tuberculosis. It has been further shown that B C G can be recovered from these lesions, but is still incapable of setting up a progressive tuberculous infection on reinoculation into fresh animals. These contentions and experiments have been supported by other observers. Lange and Clauberg[2] find B C G innocuous in guinea-pigs, and Kühn[3] and Okell and Parish[4] could neither produce generalised lesions nor raise its virulence. Similar observations have been made by Jensen, Morch, and Orskov,[5] and Remlinger and Bailly,[6] King and Park[7] find that B C G gives an appreciable immunity in guinea-pigs and Wilbert[8] and Gerlach and Kraus[9] find it of immunising value in monkeys. Webb[10] considers it should be administered to infants born of parents with open tuberculosis. Similar views in regard to the value of B C G in protecting children from tuberculosis have been expressed by Bernard,[11] Giraud,[12] Blanc,[13] Keller,[14] Malvoz and Van Beneden,[15] Moine,[16] Ott,[17] Rougebief,[18] and Weill-Halle and Turpin.[19]

Criticisms of BCG.

The observations of many other investigators raise doubts as to the innocuity and immunising value of B C G. Watson,[20] who has made prolonged observations on guinea-pigs, rabbits, and cattle, feels "fully warranted in considering B C G vaccination as in the experimental stage, and, in respect to its innocuity and efficiency, open to question." Larson and Evans,[21] Schroeder and Crawford,[22] Korschun and Dwijkoff,[23] and Uhlenhuth, Müller, and Hillenbrandt[24] find it of no value in cattle. Petroff[25] and others have found that guinea-pigs vaccinated with B C G were not protected against a subsequent experimental infection. Nohlen[26] had similar results in monkeys and Schlossmann's experiments[27] on monkeys offer him but little hope that Calmette's aim to eradicate tuberculosis by prophylactic immunisation has been achieved. Armengol,[28] Chiari, Nobel, and Sole,[29] Galli-Valeria,[30] Hutyra,[31] Moti Malkani,[32] Petroff, Branch, and Steenken[33] noticed that some of their animals died of tuberculosis after B C G inoculation, and that the virulence of B C G could be raised by animal passage. Lignières[34] does not regard B C G as harmless, and is of opinion that it confers only a transient immunity. Loewenstein[35] observes that an organism which is not virulent for the guinea-pig may be gravely pathogenic for man, and that its virulence may increase, especially in the young. Calmette's contention that if B C G is ingested during the first ten days of life enough of it would be absorbed to protect against a subsequent exogenous infection has been severely criticised on experimental grounds by Petroff[25] and others. Wallgren,[36] from his experiences in children, finds that the amount of B C G absorbed by an oral route is uncertain, and that a tuberculin reaction is the only evidence that vaccination has taken place.

Clinical observations and fatalities amongst B C G-vaccinated children have been reported by Baigue,[37] Chenard and Ferrier,[38] Girod and Debarge,[39] Heynsius van den Burgh,[40] Munoverro,[41] Nobecourt,[42] Pirquet,[43] Saye, Domingo, and Miralbell,[44] Taillens,[45] and Weill-Halle and Turpin.[19] These findings are not in accord with the entirely favourable reports which Calmette publishes from time to time regarding the innocuity and efficiency of B C G in children.[46]

Investigations in Great Britain.

Shortly after the publication of Calmette's early results, a special committee was set up by the Medical Research Council in close accord with the Ministry of Health to investigate the question of B C G. The committee desired in the first place to examine the work on B C G from the statistical and bacteriological standpoints before entering upon any clinical investigation. The statistical inquiries of Prof. Major Greenwood, F.R.S.,[47] of Wolff, in Germany, and of Rosenfeld, in Austria, have been critical of the figures quoted by Calmette, and others in favour of the B C G results. Their criticism falls under two heads. It deals with Calmette's figures on technical statistical grounds, and in the second place it draws attention to the inherent dangers of fallacy residing in the fact that infants receiving *any* special prophylactic treatment are likely to be given, consciously or unconsciously, better guardianship of many kinds than they would otherwise have received.

The experiments of Dreyer and Vollum[48] tend to show that under conditions of cultivation in a fluid medium B C G cultures can regain their former virulence. Stanley Griffith,[49] working for the Tuberculosis Committee of the Medical Research Council, shows that B C G produces little or no immunising effect in the monkey against subsequent tuberculous infection. His conclusions are as follows:—

(1) The strain of B C G used in these experiments can produce local lesions in the rhesus monkey, but these are always benign and do not lead to generalisation.

(2) B C G given by the mouth can pass through the mucous membrane of the alimentary canal into the adjacent glands and also gain access to the blood stream.

(3) Vaccination with B C G, whether by feeding or by injection, has failed to give to monkeys the complete protection against tuberculosis reported by Wilbert, but in some instances may have produced a low grade of relative immunity.

The preliminary results obtained by J. B. Buxton and Stanley Griffith[49] with calves are more encouraging.

The authors arrive at the following conclusions:—

(1) The strain of B C G used throughout these experiments would appear to be avirulent for the calf and incapable of giving rise to progressive tuberculosis even when inoculated in large doses.

(2) Whether given by the mouth or intratracheally, or by subcutaneous or intravenous injection, B C G can raise the resistance of a calf to a virulent experimental infection.

(3) An increase of resistance is less certain after feeding with B C G than after intravenous injection, though feeding with the vaccine may in some instances induce as high a resistance as injection into the tissues.

(4) Intravenous injection has proved the most satisfactory method of vaccination with B C G.

(5) The degree of increased resistance conferred upon calves by intravenous vaccination varies within wide limits, and appears in general to be directly proportionate to the dose of B C G vaccine.

The experiments were, in the first instance, concerned with questions of the best method of administration and dosage of B C G. The tests of resistance were made therefore after an interval when one might suppose that the resistance was at its highest level—that is, from two and a half to three months from the beginning of the vaccination. In future work the authors propose (*a*) to ascertain the duration of the increased resistance produced by intravenous vaccination; (*b*) to test the resistance of intravenously vaccinated calves against a natural mode of infection; (*c*) to compare the resistance produced by other antigens.

It will be recalled that Petroff[33] differentiated "rough" and "smooth" colonies in cultures of B C G. He found the smooth colonies were virulent, the rough colonies avirulent. In a recent paper R. S. Begbie[50] reported that he had obtained three types of colony from a culture of B C G—namely, "smooth," "rough," and "intermediate." Experiments on guinea-pigs did not show clear-cut lines of demarcation in the virulence of the types of growth obtained, but definite variation was noted, the "smooth" type being most virulent, the "rough" type intermediate in virulence, and the umbilicated or "intermediate" type of growth the least virulent. Begbie concludes that variants from B C G are capable of producing death from tuberculosis when inoculated into guinea-pigs, and therefore the suitability of B C G for immunisation of infants against tuberculosis must still remain open to question.

The Catastrophe at Lübeck.

During the period Feb. 24th to April 25th, 1930, 251 infants within the first ten days of life were given B C G vaccine by mouth in Lübeck. The vaccine was prepared from a culture obtained from the Pasteur Institute in Paris, and was issued from Prof. Deycke's laboratory. Some of the vaccine was administered by Prof. Deycke and his assistant, but most was entrusted to the midwives in attendance upon the births to give. According to Bruno Lange,[51] up to Oct. 18th, 1930, 74 of these children died, but seven of the deaths were not attributed to tuberculosis. Sixty-seven of the deaths were due to tuberculosis. The lesions extensively involved the glandular system, especially the mesenteric glands, and extended to the tracheobronchial glands and the lungs. The cultures obtained from the lesions proved to be those of a virulent human type of tubercle bacillus, which Bruno Lange has identified with a culture which was sent out by the Robert Koch Institute to the Kiel Laboratory, and which was sent to Lübeck at the request of Prof. Deycke in October, 1929.

Immediately, on the news of the catastrophe, Prof. G. Dreyer, F.R.S., and Captain S. R. Douglas, F.R.S., visited Lübeck on behalf of the Medical Research Council. They made a confidential report to the Tuberculosis Committee of the Medical Research Council in which they described the pathological lesions, but suspended judgment as to the cause of the fatalities pending an investigation by the German Imperial Health Council.

The report of the chief member of the Government Board, Prof. Ludwig Lange, to which have been added the statements of Prof. Neufeld (Berlin) and Dr. Kirchner (Hamburg), caused the German Imperial Health Council at its sittings on Dec. 12th and 13th, 1930, to arrive at the following conclusions regarding the fatalities at Lübeck. The illness and deaths of the infants were not traceable to the original B C G cultures, but were probably due to some unexplained admixture with virulent tubercle bacilli. The Imperial Council have also confirmed their decision of 1927 that the use of living bacilli, even in an attentuated form for human prophylaxis is undesirable in the present state of knowledge. Calmette has drawn specia attention to the exoneration of B C G in the Lübeck disaster.[52]

Conclusion.

This review of the progress of work on B C G wi account for the conservative attitude in Great Britai towards the use of the vaccine. Observations o the subject made at the Seventeenth Annual Congres of the National Association for the Prevention o Tuberculosis this year indicate that at present B C is still regarded as being in the experimental stag While uncertainty still persists as to whether the livin vaccine, B C G, is free from virulence under conditions and doubt is expressed as to its effec immunising properties, its use as an immunising agen particularly for young children, is unlikely to b advocated in this country on any extensive scale.

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THE SECOND INTERNATIONAL ORTHODONTIC CONGRESS.

THIS Congress was held at the Savoy Hotel, London, from July 20th to 24th, under the presidency of Mr. J. H. Badcock. Over 20 countries were represented, the total membership being over 400. The Congress was opened by the Mayor of Westminster, who welcomed the members to the historic city of Westminster. A letter was read from the Minister of Health, who regarded the selection of London in succession to New York as the meeting place of the second Congress as a tribute to the contributions to orthodontics by the President-General and others in this country.

After the Honorary Presidents from abroad had been welcomed by the President-General, the latter, in the course of his

PRESIDENTIAL ADDRESS,

said that orthodontics was the science and art connected with the causes and treatment of malformations of the jaws and irregularities of the teeth. It was important from the social, economic, and hygienic standpoints. An unsightly irregularity of the teeth might be the cause of an inferiority complex. It might be prejudicial to health in various ways by leading to caries and pyorrhœa. Malocclusion of the teeth was a concomitant of civilisation, and it was probably true that the more artificial the conditions under which a race lived the greater would be the percentage of persons affected with malocclusion. Malocclusion was not limited to the human race, for, according to Sir Frank Colyer, every form of irregularity might have its counterpart in the lower animals. The President suggested that a possible cause for the occurrence of malocclusion in man and animals might be deficient diet, leading to defective bone growth. The possibility of sexual selection should not be overlooked, for the somewhat narrow upper jaw, with the teeth just in evidence, and the dimple in the chin associated with mild cases of distal occlusion, undoubtedly had its attractions. Mr. Badcock paid a tribute to the earlier workers on the subject, such as John Hunter and Duval. He said that the profession owed much to the late Dr. E. H. Angle, who gave a new trend to orthodontic thought and practice. A vote of thanks to the President-General was proposed by Dr. Grieve, and carried with acclamation.

SCIENTIFIC PROCEEDINGS.

Mr. H. F. Humphreys (Birmingham) discussed the changes in the temporo-mandibular joint and its bearing on orthodontics, especially in relation to the treatment of post-normal occlusion. Dr. G.W. Grieve (Toronto), in a paper on Orthodontic Diagnosis, advocated strongly the claims of extraction in treatment, and said that many cases treated by expansion of the jaw only relapsed. Mr. H. Chapman (London) also read a paper on Extraction as a Part of Treatment, in which he gave reasons why extraction was often advisable and led to better results than the retention of all teeth. Both these papers received considerable discussion. In the absence of Prof. Simon, of Berlin, his important paper on the Practical Value of the Biometrical Norm in Orthodontics was taken as read. Dr. Martin Schwarz (Vienna) described experiments on dogs, in which the teeth were moved by means of appliances and the bone examined microscopically after the animals had been killed. The results had led him to the conclusion that the findings of Oppenheim, which were based on similar experiments and had long been accepted, were wrong.

Mr. G. G. and Mr. D. H. Campion read a joint paper on Facial Measurements in Diagnosis, in which they described investigations carried out over several years for the Dental Committee of the Medical Research Council. A paper on the Growth Changes of the Teeth and Dental Arches, by Mr. S. J. Lewis, Mr. I. Lehman, and Mr. M. Mumblatt, of Detroit, evoked a keen discussion. An interesting paper on Oversized Tongues as a Cause of Malocclusion was read by Dr. F. Neumann (Prague), who described several cases of irregularities of the teeth apparently caused by large tongues. Mr. V. H. Kazanjian (Harvard) gave an account of five cases of inferior protrusion treated surgically by resection of the mandible with excellent results. The Local Factors in the Ætiology of Malocclusion were dealt with exhaustively by Dr. Axel Lundström (Stockholm). The Changes in the Teeth and Jaws in Acromegaly were discussed by G. Korkhaus (Bonn). The place of Orthodontics in Dental Education was discussed by Leroy Miner (Boston) and C. Nord (Holland).

SOCIAL FUNCTIONS.

A banquet was held at the Savoy Hotel on July 23rd, the President-General being in the chair. More than 200 members and guests attended. After the toast of "The King," proposed by the President-General, a presentation of golf trophies was made, and the toast of the evening, which included in its terms "The Nationalities Represented," was proposed by Mr. T. Watts Eden, president of the Royal Society of Medicine. He offered greetings from this society. It had been said that deterioration of the teeth began in man when he first began to cook his food. No progress in preventive measures, he said, would be made until the cause of dental defects was found and explained to the people, and their sympathies enlisted. The dentist had succeeded in thus gaining the confidence of the people in preventive measures, for they visited him regularly to see if all was well with their teeth. It was rare indeed for anybody to go regularly to his doctor to see if he was sound in body and mind. A great responsibility lay upon the orthodontist in blazing the trail of prevention. He coupled with the toast the names of Dr. E. T. Bennett (Australia), Dr. Casto (U.S.A.), Dr. Brufau (Argentine), Dr. de Coster (Belgium), Dr. G. W. Grieve (Canada), Dr. Eduardo Ferraro (Chile), Dr. F. Neumann (Czechoslovakia), Mr. A. T. Pitts (Great Britain), Dr. J. Quintero (France), Dr. Körbitz (Germany), Dr. Nord (Holland), Dr. Rehák (Hungary), Mr. Friel (Irish Free State), Dr. d'Alise (Italy), Dr. Hisasho Saito (Japan), Dr. A. Puljo (Jugoslavia), Dr. R. Salazar (Peru), Mr. W. Floyd (South Africa), Dr. A. Lundström (Sweden), Dr. R. Schwarz (Switzerland), Dr. Habib Rihan (Syria), and a representative of Austria. Each of the members toasted having replied, Dr. C. A. Spahn, the Vice-President-General, gave the toast of "The Guests," and expressed the satisfaction of the members of the Congress at the presence of the Mayor and Mayoress of Westminster. He coupled with the toast the name of Prof. G. Elliot Smith, F.R.S., who had delivered an address to the Congress on evolutionary tendencies in teeth and jaws (see THE LANCET, July 25th, p. 199). Prof. Elliot Smith expressed on behalf of the guests their appreciation of the generous hospitality shown to them.

A reception to the members of the Congress was given by the President and Council of the Royal College of Surgeons. The guests were welcomed by Sir Holburt Waring and Mr. Sampson Handley, in the absence of Lord Moynihan. An address on Deformities and Fashion was given by Sir Arthur Keith, and the Odontological Museum was described by the Curator, Sir Frank Colyer.

IRELAND.

(FROM OUR OWN CORRESPONDENTS.)

HOSPITALS AND THE LOCAL AUTHORITIES.

THE undertaking by various hospitals to carry out for local authorities the treatment advised by school medical inspectors is causing embarrassing situations. When the various arrangements were made it does not seem that due attention was paid to the propriety of an income limit being imposed as regards those who were to obtain treatment at the special rates. It has happened, therefore, that although the local authority is able to recover the cost of treatment of school-children in cases where the parents are well-to-do, the hospitals receive the same payment as in the case of the poor, while the medical staffs receive either no fee or a merely nominal fee. In many cases the children treated are of a class which could, and should, pay for treatment at ordinary professional rates, and their treatment in a public or charitable hospital is an abuse of the functions of such an institution.

A difference of opinion of some importance in this respect has arisen in Cork. It appears that the Cork district hospital has for some time been carrying out the treatment of children sent by the school medical officers of the city, under a scheme arranged between the hospital authorities and its medical staff. In this scheme an income limit of £4 a week for parents of the children to be treated had been agreed on, and so far no difficulty had arisen. Recently, however, it was proposed to treat children from the county of Cork under a similar scheme, but the members of the medical staff found themselves unable to agree to as high an income limit for country patients as for city patients. As a result Dr. G. A. Barter, who is ophthalmic surgeon to the Cork district hospital, has refused to treat well-to-do patients *from the country as part of his duty.* The Department of Local Government and Public Health thereupo instructed the South Cork board of public assistance (the authority in charge of the district hospital) to call for Dr. Barter's resignation, and the board has passed a resolution to that effect.

The legality of any attempt to dismiss a medic officer for refusing to perform duties not contemplated in the terms of appointment is questione but, apart from the legal point, it is clear that th whole issue raised requires more serious consideratio than it has received. The hasty action of the Depar ment of Local Government and Public Health specially unfortunate, and is in contrast with usual habit of prudent deliberation.

THE HOSPITALS AND THE SWEEPSTAKES.

The Governors of the Rotunda Hospital, aft much deliberation and by a majority, have decid to apply for a share in the next sweepstake. One m assume that the governors do not like sweepstak as a method of financing hospitals, or they wo long ago have applied for participation. Their act now is almost under the compulsion of necess The hospitals which have hitherto participated, well as those which have hitherto stood out, coming to realise that the old method of finan hospitals by voluntary subscriptions is obsolesce if not obsolete. The well-to-do, when asked, subscribe, have a ready answer. If the appeal is behalf of a hospital which has benefited by sweepstakes, the answer is, "You do not need furt help." On the other hand, if the appeal is on beh of a hospital which has not participated, the ans is, "Go into the sweepstakes and you will h plenty!" In neither case is the answer a true o but it serves. Whether the voluntary system d of itself, or was killed by the sweepstakes, is a matte not easy to decide. A practical problem remai nevertheless. The sweepstakes cannot be more th a temporary expedient. What is going to be th means of future support of the hospitals? Those wh introduced the sweepstakes claimed that they wer preserving the voluntary system, and avoiding the necessity for State support and State control. It looks *now* as if they were providing the bridge between the voluntary system and nationalisation.

TESTIMONIAL TO PROF. THOMAS SINCLAIR.

A number of friends, colleagues, and pupils of Colonel Thomas Sinclair, emeritus professor of surgery in the Queen's University of Belfast, have thought it appropriate that some public recognition should be made of the distinguished services which he has rendered to that University and to the Belfast Medical School. Prof. Sinclair became professor of surgery in 1886, and occupied that chair for 37 years. He may justly be regarded as the founder of modern surgery in Ulster. Since his resignation in 1923 he has represented the University in the Imperial Parliament, and has acted as registrar and pro-chancellor of the University. He has also served as a member of the Senate in the Parliament of Northern Ireland. It has been found impossible to notify personally all the former students of Prof. Sinclair, many of whom, doubtless, would wish to share in this testimonial. Subscriptions (maximum 2 guineas) will be received by the Rt. Hon. Samuel Cunningham, 3. Donegall Square East, Belfast.

RESIDENT MEDICAL OFFICER IN A PUBLIC SCHOOL.

The governors of the Campbell College, Belfast, are to be congratulated on being the first board of any public school in Ireland to appoint a whole-time resident medical officer to look after the health of the boarders and day boys, and the hygiene of the school. Dr. Jenkins, who has been selected from many applicants, is a former captain of the St. Bartholomew's Rugby football team, and played also for the United Hospitals and Middlesex County. He has also for a period had experience of medical school work at Rugby.

Old Campbellians will regret the retirement of Mr. R. W. Leslie as medical officer to the school, a post he held for 35 years. He attended medically many of the fathers, when boys at Campbell, who have now sons at the school.

SCOTLAND.

(FROM OUR OWN CORRESPONDENT.)

A CHAIR OF CHILD LIFE AND HEALTH.

THE Edinburgh University court have appointed Charles McNeil to the Edward Clark chair of ild life and health. The establishment of this w chair has been generally welcomed and the new fessor comes to it with a fine record. He took up special study of children with the late Dr. John omson and succeeded him as senior physician to Royal Hospital for Sick Children. He is also iversity lecturer on diseases of childhood. During war he was in charge of the Scottish Hospital at uen from October, 1915.

E ROYAL COLLEGE OF PHYSICIANS' LABORATORY.

At the last quarterly meeting of the Royal College Physicians of Edinburgh, Sir Robert Philip, urator of the laboratory, was able to present a aluable report on the work of the past year. ieut.-Colonel A. G. McKendrick, the superintendent, nd 18 fellow-workers, have been engaged in 23 investigations of pathological, bacteriological, chemical, nd mathematical problems. In their studies of pidemics Colonel McKendrick and Mr. Kermack deal with the fluctuations superimposed on endemic disease by an influx of fresh individuals by birth or immigration at a constant rate. They have also analysed the epidemiology of kala-azar on data submitted from India. They find that the chance of a household becoming infected increases with the number of its members, but that individual chances of infection are *less* in larger households than in small ones. They have aimed at obtaining a quantitative relation between the chance of an individual becoming infected and the size of the household. The results are consistent with the theory that kala-azar is spread by the sand-fly, but need further investigation. The superintendent has also published a statistical review of antirabic treatment, the work being undertaken at the instance of the Health Section of the League of Nations.

In an investigation of cancer of the breast, carried out in association with the late Prof. J. Lorrain Smith, Mrs. Dawson has made an extended histological study of the normal breast during various phases of growth and activity. The malignant process does not appear to originate in the fully developed epithelial cells lining the acini of lactation. but usually in the epithelium of the small terminal ducts from which secreting acinar epithelium is itself derived. Lieut.-Colonel W. F. Harvey and Mr. Hamilton continue their research on cellular response to irritants and Lieut.-Colonel W. Glen Liston his work on hæmophilic bacteria in relation to influenza.

These and the many other inquiries summarised in the report are all of interest and, as is appropriate for a College of Physicians, they arise in the main from the materials of an active medical school and have a direct bearing on the ætiology and treatment of disease.

PARIS.

(FROM OUR OWN CORRESPONDENT.)

B C G AT THE ACADEMY OF MEDICINE.

ON July 7th two communications were made to the Academy of Medicine on the subject of B C G. It may be remembered that the Academy nominated in February of this year a commission to inquire into certain matters concerning B C G. In a preliminary report this commission has presented the following conclusions with regard to one aspect of its researches. —the harmlessness of B C G: "There is no authentic case," it says, "in which B C G, given to an infant by the mouth or subcutaneously, has become changed and provoked virulent tuberculous lesions. In the great majority of cases B C G is well tolerated by the new-born infant, producing no disturbances, and in no way hampering the development of the infant. Only occasionally, transitory and slight incidents, the most frequent of which is polyadenitis, have been seen to follow the vaccination. These incidents are of the same kind as those observed as a sequel to all sorts of vaccination. The commission recalls the injunction that vaccination of the new-born infant in infectious surroundings should be supplemented by its removal from all tuberculous contagion for at least six weeks from *the date of birth.*"

The second communication on B C G was made by Dr. G. Kern, who has made a statistical study of the infant mortality in the district of Thann (Haut-Rhin) the *stationary* character of whose population, half industrial and half agricultural, has enabled him to avoid *at least one* pitfall of a health survey. During the years 1927–30 inclusive there were 5080 births in this district, and 1698, or 33·4 per cent., of the infants were vaccinated with B C G. In 1929, as great a proportion as 49·1 per cent. of the infants born in this year were thus vaccinated; in 1930 this proportion fell to 42·3 per cent. on account of polemical publications in the newspapers. During these four years the deaths from all causes during the first 12 months of life were relatively much more numerous among the non-vaccinated controls, for whom the mortality was 10·54 per cent., whereas it was only 4·76 per cent. for the vaccinated. In no case had the vaccination given rise to any pathological incident or interfered with the growth of the child. With the growing respect which the professional statistician infuses into the bosom of the ordinary mortal, Dr.

Kern has invoked the aid of Monsieur Moine, the expert statistician of the *Comité National de Défense contre la Tuberculose,* who has verified the above figures.

OVERCROWDING OF THE MEDICAL PROFESSION.

The commission recently appointed by the Academy of Medicine to study the overcrowding of the medical profession in France has begun most logically by asking itself whether the problem it has been set to solve actually exists. It has come to the conclusion, quite emphatically, that it does. It has also come to the conclusion that this overcrowding is really due in great part to the ease with which foreigners can obtain a medical degree in France. The commission is, accordingly, in favour of the Armbruster Bill, which has already passed the first reading in the Senate and which lays down certain restrictions to the entrance of foreigners into the ranks of the medical profession in France. These restrictions are such that the foreigner who wishes to practise medicine in France will have to pass the same tests and undertake the same obligations as a Frenchman—i.e., he will have to obtain the French "baccalauréat" and become a naturalised Frenchman and be subject to military service. It is, however, suggested that the privileges accorded to Rumania in this particular field should not be withdrawn. At present some six or seven Rumanians settle every year in France to practise medicine, and it has been suggested that Rumania should henceforth be rationed with the generous quota of some 12 to 15 medical degrees a year.

UNITED STATES OF AMERICA.

(FROM AN OCCASIONAL CORRESPONDENT.)

THE RECOGNITION OF METHYL-ALCOHOL.

THE controversy as to the danger of inhaling fumes of methyl-alcohol may not be settled, but it may perhaps be admitted that in this land of prohibition the main danger of employing methanol as an antifreeze is that it will be drunk. The United States Public Health Service, anxious that no one shall have a legitimate excuse for this error, has come to an agreement with the manufacturers, by which methanol antifreeze will be coloured a uniform shade of methyl violet, and be made distasteful by chemical additions. Its container is to bear a warning label of specified design.

DROWNING ACCIDENTS.

Official and voluntary health organisations, including the American Red Cross, are now busy with the summer campaign for the prevention of drowning. When a death by drowning occurs during a "heat wave" it is usually used by the newspapers to swell the total of deaths attributed to heat. But, as a matter of fact, the seasonal loss from drowning is a heavy one, heat wave or none. In the last ten years the total deaths from drowning have risen by irregular stages from 5000 to 7000. About half of this mortality is recorded in June, July, and August. Examination of the statistics by age-groups reveals that the heaviest sufferers are youths from 15 to 19; the next heaviest, children from 10 to 14. More than half of these deaths occur before the age of 25.

CHLORAMINES IN WATER PURIFICATION.

The use of chlorine as a disinfectant in municipal water-supplies has given great satisfaction in a large number of American cities and is now almost standard practice. However, it has had one drawback: in the presence of even minute traces of phenolic waste chlorine gives rise to an exceedingly disagreeable taste. A new treatment has recently been introduced in which ammonia is first added to the water-supply and then chlorine, so that chloramines become the active disinfectant. The disinfection is not as rapid as with chlorine alone but chloramines have certain other advantages, besides the absence of "tastes" where phenol may be present. They are not rendered chemically inert by sunlight, as chlorine is, nor do they react as readily with organic matter. As a result the disinfecting action persists longer and is a greater protection in preserving water after it has been purified and while it is lying in the distributing system. Chloramine apparatus is now put on the market by the firms that manufacture chlorinators.

ALCOHOL AS CAUSE OF AUTOMOBILE ACCIDENTS.

In his latest report the Surgeon-General of th United States Army expresses alarm at the "continue increase in unnecessary deaths from automobiles." H points out that last year these were responsible fo 76 per cent. more deaths in the army than any oth one cause. All but 11 of the deaths occurred privately owned cars. In 54 cases the deceased we on pass, in 11 on duty, and in four on trips wi athletic teams, in three cases the status is n known. Mechanical defects in the car were responsib in only four cases. "In a very large percentage cases the accidents clearly occurred as the result faulty driving . . . and unfortunately too often th driver was partially intoxicated."

SUCCESS IN EARLY TREATMENT OF CANCER.

Results published by the New York State Insti for the Study of Malignant Diseases show that of a total of 1229 cases, 307, or about 25 per ce remained well five years or more after treatmen the majority, of course, the condition was adva at the time of treatment. Among the cases clas as early were 65 cancers of the lip, of which 47 w well after five years; 14 cancers of the uterus, of wh nine were well after five years; and 60 cancers of th breast, of which 34 were well after five years. Th best results have been obtained with the basal c epitheliomas.

A DIAGNOSTIC TEST FOR CANCER?

Two months ago[1] we commented on the highly technical work in which Dr. S. G. T. Bendien had given an account of specific changes in the blood serum, which he claimed to have discovered in disease, especially in cancer and tuberculosis. In connexion with this work the following statement has appeared in the lay press, as having been issued by the British Empire Cancer Campaign.

> On learning of the claim by Dr. Bendien, of Zeist, Holland, that he had discovered a method of diagnosing cancer by examination of the blood, the British Empire Cancer Campaign, following its regular procedure, instituted inquiries. As a result it was decided in agreement with Dr. Bendien to put the matter to a test. Samples of blood were taken from 38 persons, some cancerous (as determined by microscopic examination). These samples of blood were taken in London by a physician on the staff of a large London hospital and the test-tubes containing the samples were numbered. The numbers and corresponding diagnoses

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[1] See THE LANCET, 1931, i., 1096.

were entered on a sheet of paper and placed in a sealed envelope. The samples of blood and the sealed envelope were then conveyed by Dr. Piney, scientific secretary of the investigation committee of the campaign, to Dr. Bendien's laboratory. Dr. Piney himself was unaware of the diagnoses and was present throughout the entire test.

Twenty-one specimens were tested—five were taken from ancerous patients, two from normal people, and fourteen rom patients with other diseases. Dr. Bendien correctly iagnosed the five specimens known to be from cancerous atients and the two taken from normal individuals. In ddition, he diagnosed one of the remainder as cancerous. urther investigation of this case in London has proved that is diagnosis was also correct in this case.

The above is a short statement of the facts, but the ritish Empire Cancer Campaign feels it necessary in the ublic interest to make the following comments:—

1. The discovery of Dr. Bendien appears to mark definite rance in cancer research in respect of the aid it brings diagnosis of cancer, but some time must elapse before e full value of the method can be obtained.

2. It is important to lay emphasis on the fact that this ood test is for diagnosis and for diagnosis alone.

It is obvious that this preliminary test is not equate to establish a method of diagnosis, and that much larger series of tests, not only on the serums of tients with cancer, but also of patients suffering m a variety of other diseases, will have to be made.

DRUGS, SURGICAL INSTRUMENTS, APPLIANCES, AND FOODS.

B.M.A. EXHIBITION AT EASTBOURNE.

HE usual trade exhibit was opened at Devonshire k on July 21st by the President-Elect, Dr. W. G. loughby. It was housed in a temporary building cially erected for the purpose and, despite the ression through which trade is passing, there was lly display of both new and well-tried products evices. Only a few items can be picked out for on from each stand.

Drugs and Pharmaceutical Preparations.

I. GENERAL DRUG EXHIBITS.

60 and 68] Allen and Hanburys (Bethnal Green, 2) drew attention, among their many preparations, Eucortone, a suprarenal cortex extract for use in ldison's disease; Byno Eugastrol, an extract of sh hog's stomach tissue for the treatment of, nicious anæmia; Byno Hepol, a palatable liver ract and malt preparation; I-so-gel, a sugar-free getable laxative, acting by absorption of fluid; d Euvalerol elixirs, containing valerian.—[30] mour and Co., Ltd. (Armour House, St. Martin's-Grand, E.C. 1), showed their well-known Glanoid and preparations, and also a concentrated fluid tract of liver; a new calves'-foot jelly; Chymol, nutritive, and invalid beef preparations.—[72] ayer Products, Ltd. (19, St. Dunstan's Hill, E.C.3), tracted the visitor's attention by a blue and silver and on which were displayed the latest results of eir research work; for example, Lacarnol, a ucleosid extract said to have a remarkable ffect on the coronary arteries in angina; Elityran, new thyroid preparation accurately standardised y its weight-reducing properties in guinea-pigs; nd Abrodil, an iodine medium for excretion pyegraphy; the well-known Avertin, Luminal, and ovalgin were also shown.—[62] Boots Pure Drug o., Ltd. (Nottingham), showed a range of drugs, ncluding Acriflavine, in sterile solution, powder, mulsion and solution tablets; Lederle's Antineumococcus serum; Hexyl-resorcinol, Insulin, iver extract, and a highly concentrated fluid extract f fresh liver, and Stabilarsan and Sulphostab.—51] British Colloids, Ltd. (Gorst-road, Park Royal, N.W.10), had their well-known Collosol preparations on view, among the newest being Tetanol, a Collosol calcium put up with vitamin D, for oral use—the calcium for injection being prepared without the vitamin, as vitamin is not absorbed by this route; preparations of iron with copper, notably collosol "F.C.V.D.," a combination of collosol ferrum and collosol cuprum with malt extract and irradiated ergosterol, copper having been shown fto activate other metals; and Colsul, 1 per cent. sulphur, now supplied in aqueous solution to avoid the pain caused by oil injections. Their collosol tannic sprayed adaptor has been designed especially for the rapid application of tannic acid to burns. [83] The British Drug Houses, Ltd. (Graham-street, City-road, N.1), showed a number of new products among theirmany well-known ones; Avoleum is a highly concentrated and standardised solution of vitamin A alone; Carotene is available in sugar-coated pellets, each containing 2 mg.; Livogen is a potent liver extract put up with hæmoglobin and vitamin B for secondary anæmias; Gaster Siccata B.D.H. is a stomach preparation resembling a dried milk; the B.D.H. ureamometer outfit furnishes a simple clinical apparatus for estimating blood-urea from a single drop.—[57] Burroughs Wellcome and Co., Ltd. (Snow Hill Buildings, E.C. 1), had, as usual, an attractive stand to display their tabloid, soloid, hypoloid and other products; an illuminated pyramid indicated the modern treatment of rickets, asthma, cardiac conditions and certain obstetric emergencies, and Kepler cod-liver oil with malt extract was recommended for rickets; Ephedrine, Diginutin, and Infundin are well known, but Tabloid carotene was here exhibited for the first time.—[11] Reed and Carnrick (distributing agents: Coates and Cooper, Ltd., 41, Great Tower-street, E.C. 3) displayed their gland preparations, drawing special attention to Nephritin, composed of cortex and convoluted cubules and used in acute nephritis; Ovacoids, containing entire ovary and anterior pituitary; Endomin, a kind of synthetic liver preparation containing all the known metallic compounds in liver ash; Thyracoids, a new biologically standardised iodothyroglobulin, and Brosedan, a bromide-yeast preparation.—[33] Evans, Sons, Lescher and Webb, Ltd. (56, Hanover-street, Liverpool, and 50, Bartholomew Close, E.C. 1), demonstrated the various specialities manufactured in their research laboratories, particularly an extract of suprarenal cortex; Hepatex, P.A.F., a solution of the liver fraction specific in pernicious anæmia, for injection; Hepovite, a compound elixir of hepatex; and Ephregel Nasal Jelly, a combination of ephedrine and adrenalin with analgesics and aromatics.—[44] C. J. Hewlett and Son, Ltd. (35–42, Charlotte-street, and 83–85, Curtain-road, E.C. 4), in addition to their old favourites Mist. Pepsinæ co. c. Bismutho and Liq. Ergotæ Purif., showed Hepatagen, an aperient and cholagogue; Veronigen, a barbitone hypnotic; and also useful general practitioner's and midwifery bags containing all essential equipment in an easily accessible arrangement.—[69] Hoffmann-la Roche Chemical Works, Ltd. (51, Bowes-road, N. 13), showed their well-known sedative preparations, of which Allonal and Sedormid were taken up Mount Kamet on the recent expedition, for the insomnia of heights; the handy Tubonic ampoule-syringes once more attracted interest.—[4] May and Baker, Ltd. (Battersea, S.W. 11), had many products on view, notably their preparations for venereal disease—"914" and others; Propidex, an ointment containing a mixed vaccine of streptococci, staphylococci, and *B. pyocyaneus*, for local vaccine therapy; Planocaine, a local anæsthetic less toxic than cocaine; magnesium hyposulphite in ampoules and tablets, for allergic conditions; Neptal, an organic mercurial diuretic; and Duracaine.—[76] Oppenheimer, Son, and Co., Ltd. (Handforth Laboratories, Clapham-road, S.W. 9), showed their familiar Palatinoids, Bipalatinoids, and Pulverettes, and also Dimol; Cocoids—tiny chocolate tablets for children—and Roboleine, the popular reconstructive food.—

Lieut.-Colonel FREMANTLE asked whether, as a result of this, the Secretary of State had advised people not to congregate on their holidays.

Mr. WESTWOOD said that the point of that supplementary question was not in the original question. He had answered everything in the question.

Replying to the Speaker, Lieut.-Colonel FREMANTLE pointed out that this was an extraordinarily serious question, on which all the country wanted advice. Action had already been taken on the advice of the Minister on those actual facts, and it was on those facts that he wanted to cross-examine the Minister.

The Speaker said that question time was not the time for cross-examination.

Mr. PYBUS asked if it was in order for a Member to ask a question which if it got into the press would damage the prospects of every seaside resort in the country.

Lieut.-Colonel FREMANTLE gave notice that he would raise the question, both in regard to the Ministry of Health for England and Wales and in regard to Scotland, on the Appropriation Bill.

Mr. MARJORIBANKS asked the Secretary of State for War whether, in view of the increase of meningitis in the army at home, he had taken any and, if so, what steps of a precautionary nature.—Mr. SHAW replied: I can assure the hon. Member that every possible precaution is being taken.

Mr. MARJORIBANKS asked if any steps had been taken in regard to the permanent buildings in which the army was situated, especially in regard to the winter months.

Mr. SHAW said that special precautions had been taken with regard to the sterilisation of utensils, with regard to ventilation, over-crowding and, above all, to the persons who were suspected of being carriers of the disease. He did not think there was need to make special provision with regard to the permanent buildings.

TUESDAY, JULY 28TH.

Road Accidents in London.

Mr. NAYLOR asked the Home Secretary how many fatal and non-fatal road accidents had occurred in the Metropolitan area since the abolition of the speed limit; and how many occurred during the corresponding calendar period prior to the abolition.—Mr. CLYNES replied: The figures are as follows:—Return of the number of accidents in which persons were killed or injured within the Metropolitan Police District during the months of January, February, March, April, May, and June, 1930 and 1931:—

Month.	1930.		1931.	
	Fatal accidents.	Non-fatal accidents.	Fatal accidents.	Non-fatal accidents.
January ..	118	3501	86	3016
February ..	102	2928	87	2804
March ..	98	3960	113	3259
April ..	112	4243	108	4011
May	109	4798	114	4727
June.. ..	109	*	116	*
Totals ..	648	19,430	624	17,817

* The figures for the non-fatal accidents for the months of June, 1930 and 1931, are omitted as those for the 1931 period are not yet available.

Opium Consumption in the Far East.

Mr. WELLOCK asked the Under-Secretary of State for the Colonies, whether any steps were being taken in British Colonies and Dependencies to carry out the recommendations of the Report of the commission of inquiry into the control of opium consumption in the Far East.—Dr. SHIELS replied: The recommendations have been carefully considered by the Governments concerned, but it is considered advisable to defer any changes in the existing system of control until the Commission's recommendations have been fully discussed at the International Conference which is to be held at Bangkok in November.

THE PLYMOUTH HOSPITALS.—The recent Plymouth Hospitals' Fair has produced £13,000. Last week the Mayor of Plymouth opened additions to Swilly Hospital.

ST. BARTHOLOMEW'S ADVISORY COMMITTEE.—The advisory revenue and expenditure committee, which it was recently decided to appoint, has now been constituted as follows: Sir Phené Neal (Lord Mayor of London), Lord Plender, Sir William McLintock, Mr. Cecil Lubbock, and Mr. Stanley Christopherson. The committee will advise on the financial policy of the hospital and on all proposals involving extraordinary capital expenditure or material increase in ordinary maintenance costs.

THE SERVICES

ROYAL ARMY MEDICAL CORPS.

Lt. (on prob.) W. A. Robinson, from the secd. list, is restd. to the estabt.

L. T. Furnivall to be Lt. (on prob.) and is secd. under the provisions of Art. 213, Royal Warrant for Pay and Promotion, 1931, from that date.

TERRITORIAL ARMY.

Lt. R. H. Yelf (late Loyal R.) to be Lt.

INDIAN MEDICAL SERVICE.

Capt. G. V. Gollerkeri relinquishes his temp. comma

MEDICAL NEWS

University of Cambridge.

At recent examinations the following candidates successful:—

D.M.R.E.

Part II.—Walter Addey, William Ahern, G. S. Bhar H. W. Davies, G. C. Fairchild, C. P. Goswami, J. J. O'C and Thomas Simpson.

University of London.

On the occasion of the centenary meeting of the Brit Association in London next September the Senate decided to confer the honorary degree of Doctor of Sci on General Smuts, F.R.S., the President, and on Sir Gow Hopkins (the present President of the Royal Society), Rutherford of Nelson, O.M., Sir Charles Sherrington, O and Sir Joseph J. Thomson, O.M., all of whom have occu the same office.

At recent examinations the following candidates successful:—

FOURTH EXAMINATION FOR B.D.S.

Ronald Lawton, King's Coll. Hosp.; T. W. E. Pugh, Hosp.; and W. M. Sinclair, King's Coll. Hosp.

University of Edinburgh.

On July 22nd the following degrees and diplomas conferred:—

M.D.—† R. S. Begbie (in absentiâ), William Bird, ‡ Bloom (in absentiâ), E. M. R. Frazer, H. H. C. Fuller, ander Hood, F. M. Khan (in absentiâ), D. T. Mackie, Macqueen (in absentiâ), ‡ P. V. Pritchard, and J. O. Re absentiâ).

† Highly commended for Thesis. ‡ Commended for The

D.Sc.—Donald Mainland, M.B. (in absentiâ).

Ph.D.—J. C. David, M.B. (in absentiâ).

M.B., Ch.B.—N. S. Alcock, D. M. Anderson, * W. Arnott, J. B. Arthur, C. E. S. Bailey, G. M. Balfour, J Barnetson, J. C. Barnetson, I. M. Bell, C. H. Bentley, Berry, B. S. Bindra, W. G. Bisset, A. D. Broatch, * J. Brown, D. G. Brownlie, A. A. Buxton, A. J. Campbell, J Candy, * Gurth Carpenter, J. K. Chappell, R. T. Cooke, A Cooper, W. J. Cowan, P. N. Cutner, C. G. Cutting, Ja Davidson, J. L. Dobbie, I. I. Felner, P. J. K. Ferguson, H Fernando, Isidor Feuer, F. S. Fiddes, T. M. S. Findlater, W Fost, F. A. Franklin, G. A. Fraser, N. S. Fraser, Michael Ga E. J. D. Gillespie, G. C. Gillison, G. A. D. Gordon, Israel Gor A. R. Graham, E. R. Gunson, Endre Gunstensen, * J. G. Hamilton, J. S. Hamilton, M. L. Hart, W. D. Hende Ana Van Hoesen, R. G. Hood, A. W. Hopkins, R. S. How A. M. Hunter, Janet C. Hyslop, Miriam Jansen van Vu Archibald Jeffrey, R. G. Johnson, M. S. Jones, Prasert Ka dalya, R. J. Kellar, Isobel O. Kennedy, A. J. Kotzé, A Kramer, R. A. H. Krynauw, Frank Lederfeind, Arthur Le Low, W. M. Leslie, M. J. Liebenberg, R. S. Lind, D. C. Lo E. W. Low, R. M. S. M'Conaghey, W. G. M'David, P. M'Kinlay, Flora S. MacNaughtan, A. R. M'Pherson, C. Massey, G. H. Meiring, Stephen Melmed, H. O. M. Merewet Harry Meyer, R. L. H. Minchin, J. C. G. Mitchell, P. K. Morris Rosa Morrison, C. S. Morrow, M. T. Murchison, Sidney Neche John Neill, M. E. Neuman, M. M. Parker, A. R. Parkes, Ja W. R. Paton, David Peeker, Margaret I. Porteous, F. P. Re F. M. Rifkin, A. A. Robertson, J. H. G. Robertson, Richa Ropner, Alice M. Ross, Frances E. T. Ross, T. F. Ros Benjamin Rubin, E. J. Samuel, S. S. Sawaf, H. H. Sawick J. A. Scott, Henry Shaffer, A. F. A. F. Shahin, E. H. C. Shepherd, J. L. Skene, Ruby J. B. Slater, I. S. Smillie, Jack Spark Silverson, Dorothy M. Stuart, D. B. Swart, Grace H. Thomson, Helen Turner, C. E. van Rooyen, J. Y. Walker, Henry Water, R. E. Waterston, G. W. Watson, Andrew Watt, A. M. Watt, I. I. Weiss, Barbara C. Welsh, J. H. Wilson, R. B. Wilson, and Robert Woodrow.

D.T.M. & H.—A. A. F. Brown, and W. R. Duff.

Diploma in Radiology.—Angus Campbell, R. J. W. Charlton, A. J. Groenewald, D. G. Maitland, and W. S. Shearer.

The following awards were made: Syme Surgical Fellowship, John Bruce, M.B.; Gunning Victoria Jubilee Prize in Surgery, I. G. W. Hill, M.B.; Lauder Brunton Prize in Pharmacology and Therapeutics, C. M. Scott, M.B. Ettles Scholarship and Leslie Gold Medal, J. G. M. Hamilton, M.B.; Allan Fellowship n Clinical Medicine and Clinical Surgery, J. G. M. Hamilton, M.B.; Murchison Scholarship in Clinical Medicine, W. M. Arnott, M.B., and R. J. Kellar, M.B.; M'Cosh Graduate's and Medical Bursaries, H. A. Raeburn, M.B.; Mouat Scholarship n the Practice of Physic, P. C. M'Kinlay, M.B.; Buchanan cholarship in Midwifery and Gynæcology, R. J. Kellar, M.B.; ames Scott Scholarship in Midwifery, Arthur Lees-Low, M.B., nd J. A. Scott, M.B.; Beaney Prize in Anatomy and Surgery, hurth Carpenter, M.B.; Conan Doyle Prize, Israel Gordon, I.B.; Annandale Gold Medal in Clinical Surgery, R. J. Kellar, .B.; Murdoch Brown Silver Medal in Clinical Medicine, W. M. rnott, M.B.; Royal Victoria Hospital Tuberculosis Trust old Medal, J. H. Wilson, M.B.; Thomson Medal in Diseases Children, W. S. M'R. Craig, M.B.; Scottish Association Medical Education of Women Prize, Jean W. R. Paton, .B.; Dorothy Gilfillan Prize, Isobel O. Kennedy, M.B., and an W. R. Paton, M.B.; Wightman Prize in Clinical Medicine, J. Kellar, M.B.; Pattison Prize in Clinical Surgery, J. J. M. own, M.B.; Cunningham Medal and Prize in Anatomy, W. Armour, Ph.D.

The Cameron Prize in Practical Therapeutics has been awarded Madame Marie Curie, Director of the Curie Laboratories at the dium Institute of the University of Paris, "in recognition he fruitful therapeutic results which have been made possible her discovery of radium."

* With Honours.

yal College of Surgeons of Edinburgh.

At a recent meeting of the College, with Dr. James Haig rguson, the President, in the chair, the following 26 cessful candidates (out of 96 entered), who passed the uisite examinations between March 26th and April 4th, e admitted as Fellows:—

opinath Ganesh Ambegaokar, M.B. Bombay; David lliam Bawtree, M.B. Camb.; Andrew Johnstone Brown, .C.P., L.D.S. Edin.; James Roderick Johnston Cameron, .C.P., L.D.S. Edin.; Cecil Nathaniel Love Cantor, M.D. b.; Harold Carter, M.B. Edin.; Joseph Jefferson Coulthard, . Edin.; David Sydney Davies, M.D. Oxf.; James Bruce var, M.B. Edin.; Duncan Iain Campbell Finlayson, M.B. n.; Henry Parke Forster, M.B. Cape Town; Noel Gerald leton Gane, M.R.C.S. Eng.; Robert Grieve Hutchison, .F.P.S. Glasg.; John Godfrey Kingsbury, M.B. Lond.; n Eric Lane, M.R.C.S. Eng.; John Christian Mayo, Adelaide; John Horsfield Otty, M.B. Aberd.; Leslie thron Patrick, M.B. Edin.; Robert Gordon Paul, L.R.C.P. a.; Thomas Mackenzie Reid, M.B. Edin.; Edwin Moody ertson, M.B. Edin.; Eric Hugo Thomas Rutherford, M.B. and.; Robert Sampson, M.B. Edin.; Walter Netley Searle, N.Z.; Bronte Creagh Smeaton, M.B. Adelaide; and d Wardrop, M.R.C.S. Eng.

the same meeting Rebecca Evelyn Roulston, M.B. Glasg., passed the examination in 1930, was admitted a Fellow.

al Sanitary Institute.

ord Balfour of Burleigh has been elected President the Institute in succession to the late Duke of thumberland.

yal College of Physicians of Edinburgh.

quarterly meeting of the College was held on July 21st, h Sir Norman Walker, the President, in the chair.

Dr. George Hector Percival (Edinburgh), Dr. David Lees, inburgh), Miss Margaret Black Martin (Edinburgh), d Dr. Joseph Ryland Whitaker (Edinburgh) were introced and took their seats as Fellows of the College.—Dr. omas Douglas Inch (Gorebridge), Dr. Walter John May urban), Dr. Edward Robert Charles Walker (Aberdeen), d Dr. David Taylor Mackie (Exeter) were elected to e Fellowship.

Dr. James Collier (London) was appointed Morison cturer for 1932.

Research Fellowship.—In accordance with the bequest by rs. Isabella Kirk Duncanson, to commemorate the late r. J. J. Kirk Duncanson, the council will award a Kirk uncanson Research Fellowship next October. A Fellowship ill be awarded annually for a period of one year, and may e renewed for two additional periods of a year each. The molument will be upwards of £150 for the first year, about 250 for the second year, and about £350 for the third year. n making the first award special consideration will be given o the claims of candidates who propose to devote themselves o diseases of the ear, nose, or throat. Applications must e made in proper form before Oct. 15th.

nternational Surgical Congress.

The ninth congress of the Société Internationale de Chirurgie will be held in Madrid from March 15th to 18th, 1932, with Prof. F. de Quervain, of Berne, as president. The chief subjects of discussion will be tumours of the spine, non-tuberculous pulmonary suppuration, the surgery f the œsophagus, and surgical anæsthetics. For the first time since the late war the speakers will include representatives of German surgery. The address of the secretary-general, Dr. L. Mayer, is 72, rue de la Loi, Brussels.

National Hospital, Queen-square.

The out-patient department of this hospital will be closed during the first three weeks in August.

St. Mary's Hospital Dinner.

The annual dinner of past and present students of St. Mary's Hospital, London, will be held at the Trocadero Restaurant, Piccadilly-circus, on Friday, Oct. 2nd, at 7 P.M.

Argentine Medical Congress.

Lord Moynihan, President of the Royal College of Surgeons, has sailed for South America, where he is to represent the British medical profession at the coming congress at Buenos Aires.

St. Thomas's Hospital Dinner.

The old students' dinner will be held at the May Fair Hotel, Berkeley-street, London, W., at 7.30 for 8 P.M. on Friday, Oct. 2nd, with Mr. J. Herbert Fisher in the chair.

International Tropical Medicine.

An International Federation of Societies of Tropical Medicine and Hygiene has been constituted under the presidency of Prof. C. Achard, of Paris. The preliminary discussions took place at the invitation of the *Revue des Maladies des Pays Chauds*, and societies from some twenty countries have joined the federation.

German Pharmacological Society.

This year's congress of the Deutsche Pharmakologische Gesellschaft, which was to have been held at Vienna from Sept. 20th to 23rd, has been indefinitely postponed because of the economic situation in Germany and consequent difficulties of travel.

Medical Tour in Italy.

We are informed that there are still a few vacancies in the medical tour to Italian resorts and spas organised by the Italian State Tourist Department (E.N.I.T.) in September and October next. Members of the party will assemble at Rome on Sept. 18th and the tour will end at Palermo on Oct. 2nd. Particulars may be had from the British representative, Major W. Stormont, at 16, Waterloo-place, London, S.W.1.

Research Fellowships in Tuberculosis.

The Medical Research Council announce that they have awarded Dorothy Temple Cross Fellowships for 1931–32 to Charles Allan Birch, M.R.C.P., senior medical registrar and tutor at the Royal Infirmary, Liverpool, and to Roy Lars Vollum, D.Phil., demonstrator in pathology in the University of Oxford. Dr. Birch has received a Fellowship for the study of problems of tuberculosis at industrial centres in the United States. Dr. Vollum will study recent developments in methods for the investigation of tuberculosis, in Germany and Austria. The Fellowship awarded last year to Lieut. Sidney Malcolm Burrows, R.A.M.C., late clinical assistant in the Tuberculosis Department at St. Thomas's Hospital, has been renewed for a further year.

Epsom College, Founder's Day.

Founder's Day was celebrated at Epsom College on Saturday, July 25th, when the Chairman of the Council, Dr. Raymond Crawfurd, distributed the prizes and afterwards spoke to the boys on the true aims of education, —namely, the production of a healthy body, an active, intelligent mind, and steadfastness of character. He referred to the steps recently taken by the Council to extend the teaching of biology by making it a school certificate subject, and gave the boys a clear insight into the most pleasurable way of combining biology and natural history. The range of recreational activities had been extended, he added, by building four new hard tennis-courts, now nearing completion.

The headmaster, Mr. A. C. Powell, reported on the school's activities during the past year, and announced that Lord Dawson of Penn had agreed to open the new sanatorium on Saturday, Oct. 3rd. Among the beneficial results that would accrue from the building, not the least, he said, was that additional boys were able to be taken into the previous sanatorium as a waiting house, which now was necessary.

With the conclusion of the proceedings in Big School rain fell in torrents and an assault-at-arms, planned for the open air, had to be transferred, hurriedly, to the gymnasium, which could not possibly cope with everyone anxious to witness a most excellent performance. About 1000 guests were present at tea, and its says much for all concerned that the great majority braved the elements in order to witness in the evening an enjoyable production of "Patience" by the College Choral Society.

NOTES, COMMENTS, AND ABSTRACTS

THE HOSPITALS OF JAPAN.

(FROM A CORRESPONDENT IN TOKYO.)

JAPANESE hospitals may be said to have their origin in the Nara period (710–780). There were then established the *hiden-in* (medical treatment) and the *seyakuin* (medicine dispensing) institutions. They were organised and conducted by the Buddhists, and were nothing more than charitable institutions for social welfare. Later, in the Kamakura era (1185–1333) we find traces of the *ryobyoin* (charity hospitals) and the *hiden-in*, institutions of a similar nature, but without either accommodation or the elementary requirements of a modern hospital.

During the civil wars (1464–1586) Hideyoshi Toyotomi re-established the *seyakuin*, but it did not become a permanent institution. After this, Louis Almeida, the Portuguese, built a sort of combined leper hospital and orphanage, but this, again, was not maintained. It is noteworthy that from the introduction of medical science into Japan the foreigners have been the pioneers in caring for the lepers.

As early as 1722 Shogun Yoshimune Tokugawa built a kind of convalescent home within the grounds of what was then known as the Hakusan Medicine Garden, at Koishikawa, Tokyo. This is considered by the Japanese as the precursor of the first state medical institution. It was established on the advice of Dr. Sensen Ogawa, and at first accommodated 40 patients. This number had increased to 100 by the year 1723, and in 1729 the home was able to take 150 convalescents. Yoshimune Tokugawa also built a *seyakuin*, or "medicine-giving place." After this facilities were afforded for the treatment of patients in the so-called medical schools of the subordinate lords, or *dainyo*, as also in the private schools established by the eminent physicians of Edo (Tokyo), Osaka, and Kyoto.

Those places could not, of course, as yet be called hospitals in anything like the modern sense of the word, but a century later, in 1868, there came the Meiji restoration, when the medical school at the home of Todo, at Shitaya, Edo, was named the Dai Byoin (Great Hospital), and the original medical school was considered attached to it. In 1869 this Dai Byoin was annexed by the university. While this was taking place in the capital most of the medical schools of the leading clans, which had become absorbed in the empire, were transformed into medical schools and hospitals in the then modern sense. Some, however, were transformed into prefectural hospitals, so that to-day the prefectural hospitals of Kagoshima, Hiroshima, Gifu, Nara, Morioka, and Yamagata are the transformations of the old clan hospitals of the pre-Meiji feudal Japan.

Special hospitals dating from this time around the restoration are the Matsuzawa hospital for mental diseases, established in 1888, the Tokyo City Hospital (established in 1872), while in more recent times there are the Yokohama Juzen Hospital (1920) and the Kobe Shimin (Citizens') Hospital (1920).

Foreign Influence.

It would not be out of place to mention here that William Willis, an Englishman, introduced the English school of medicine to Japan in the first year of Meiji, 1868. He came to Japan for this purpose at the invitation of the Kagoshima clan. Willis rendered valuable service during the restoration, and as a mark of appreciation was appointed professor of medicine in the Tokyo Hospital attached to Igakusho, the nucleus of which is now the Imperial University of Tokyo.

At the present time the German influence is probably greatest—the pre-war prestige of German medicine being largely reinstated in Japan. American influence is almost exclusively limited to that of the variou missionary societies. At St. Luke's Hospital, th largest and most important of the American or foreig institutions, it is proposed to establish a medic faculty by amalgamation with the American privat university of Rikkyo (St. Paul's College).

Private and Public Benefactions.

Among the hospitals built by Japanese philan thropists the most important to-day are the Mits Philanthropic Hospital (1909), the Yamaguchi Kos Hospital (1925), and the Okayama Tuberculos Hospital. The Red Cross Society, which was establishe in 1882, and increased considerably in importan with the Sino-Japanese war, in 1894, and the Russ Japanese war, in 1904, has its chief hospitals in Toky with branch hospitals elsewhere. Osaka has also i Electric (Bureau) Hospital, while the railway offi has its own hospitals in six of Japan's largest towns- Tokyo, Nagoya, Osaka, Sendai, Moji, and Sappo Other hospitals of importance are those establish by the charity organisations, of which the best know is that belonging to the saiseikai, or relief associatio This was founded by the money and encourageme of the Emperor Meiji himself, who intended it as philanthropic hospital for the poor. With its imper patronage the saiseikai built its head hospital Tokyo, with branch hospitals in Osaka, Kanaga Hyogo, Fukuoka, Kyoto, and Kochi. It also cont 41 clinics, 3 tuberculosis hospitals, 1 orphanage, 15 itinerary medical corps, and it receives an an state subsidy of £25,000.

Present Position.

The present state of Japanese hospitals gives g promise for the future, but, unfortunately, there an increasing number of private clinics which make establishment of larger and better-equipped ins tions more difficult.

Leprosy, Tubercle, and Mental Disease.

The Government has at last taken steps to augm the Empress Dowager's grant for the establishmen leper hospitals, which was, perhaps, Japan's m pressing need. Though the Government's plan eradicate leprosy within 30 years is not thou feasible by the medical and other critics, it is m encouraging to see that at last an attempt is be made to promote the work begun and carried on years, almost unaided, by foreign Christian missio The same may be said of the tuberculosis sanatoriu Here, too, the Government has decided on th establishment of sanatoriums throughout the countr but in view of the large number of tuberculous peop within the Empire the scheme even when complete wi be quite inadequate.

Another branch of medicine sorely neglected i Japan at present is the treatment of mental diseas Here the State has done little so far, and for the moment there appears little prospect of anything bei done officially. In a country where it is considered the family's painful duty to care for its own idiot children, and where, at the same time, it is believed to be a curse of the gods if a family should number an idiot among its members, it may well be imagined what is the general fate of lunatics. Fortunately there is nowadays a healthy reaction in these and other matters—thanks largely to the Japanese and foreign English press.

The raising of women's status in Japan will no doubt serve to abolish many abuses, and must also considerably advance the welfare of children. The first Women's Suffrage Bill, which was recently introduced in the Diet, was rejected by the House of Peers after having passed the Lower House, but a long-closed door has begun to open. That Japan is daily taking an increasing interest in medicine and eugenics is patent to all who are in any way acquainted with the country.

NICOT AND THE DISCOVERY OF TOBACCO.

THE fourth centenary of the birth of Jean Nicot, French ambassador to the Court of Portugal from 1559 to 1561, was the occasion last year of much celebration of his fame as the discoverer of tobacco. Dr. Paul Koenig[1] holds this reputation to be undeserved. Although, he says, Nicot did much to popularise this herb in France, it had been known In Europe before his birth. Dr. Pedro Martyr de Angleria, a friend of Columbus, published in Seville, n 1511, and in Paris 21 years later, a work entitled De Rebus Ocenanicis et de Orbo Novo Decades Tres, n which he mentioned the account of tobacco ommunicated to Columbus in a letter by Fray Romano Pane, who had remained in Hispaniola as a missionary. The honour of first bringing tobacco to France belongs, according to Dr. Koenig, to a armelite called André Thevet, who went to Rio de aneiro with the Maltese knight Nicolas Durant n 1555. In 1558, Thevet described the plant in a book (which probably contains the earliest extant escription of a cigar) and cultivated it under the ame of "l'herbe angoulmoisine," after his birthplace, Angoulême. Nevertheless, Thevet did nothing popularise tobacco, and in the opinion of Dr. Koenig was probably growing *Nicotiana rustica*, hich his friends would have found too strong. ccording to the more credible of two accounts, icot saw the plant flowering in the garden of the lace at Seville, begged some seeds from the d gardener, and raised them at the Embassy. learned its therapeutic properties—perhaps, Koenig suggests, from Prof. Nicolo Monardes, o then occupied the chair of medicine at Seville—d called it the "Wonder-plant." He succeeded curing ulcers and wounds with applications of the h leaves, and soon acquired great fame, first in bon and then in Paris. He named tobacco icotiana" after himself, and, as a step towards perpetuation of this name, incorporated it in the tionary of the French language which he compiled. was displaced in popular speech by various forms the word "tabaco," the aboriginals' name for their e, but has survived in the language of botany, the fame of Nicot has been immortalised in the me of the alkaloid nicotine, first isolated at idelberg in 1828 by Reinmann and Posselt. Nevereless, to judge by the present importance of bacco in civilised life, it is doubtful whether any man was ever indispensable to its popularisation Europe. It entered England independently of icot, and if he had not brought it to France from ortugal someone else would certainly have brought in from this country.

A NEW ARC LAMP.

WITH the ordinary open carbon arc running on irect current, the potential difference across the lectrodes is about 45 volts. The difference between his value and the voltage of the supply has to be aken up in a series resistance. This involves much oss of efficiency, since only a small proportion of he power drawn from the main is employed in the rc itself. Any attempt to increase the potential ifference across the electrodes by increasing the ength of the arc results in irregular running conditions. The length of an enclosed arc can be considerably increased without producing this effect, but for therapeutic work the glass container absorbs the effective part of the radiation.

The Kandem arc, recently put forward by Messrs. Korling and Mathiesen, of Leipzig, is a successful attempt to get over these difficulties. The arc is struck between two cored carbons mounted horizontally in a cylindrical metal housing. *In the front* of this chamber a rectangular window is cut. The window is not glazed or covered in any way. The arc is controlled by an automatic mechanism to run at a length of about 2½ in., but owing to the enclosure the discharge is perfectly steady. A magnetic blower is fitted in such a position as to flatten the arc so that it is a horizontal flame, and not bent into an arch as otherwise it would be by the upward current of hot gases. Owing to the length of the flame the potential difference across the electrodes is 110 to 120 volts. Hence a much higher proportion of the energy drawn from the mains is applied to the generation of ultra-violet radiation instead of being lost as heat in the series resistance. It has been shown by Angus that in the carbon arc a long flame is more efficient for the same current than a short one for therapeutic application, because the valuable radiation comes from the discharge rather than the incandescent electrodes.

Other advantages, too, are claimed for mounting the arc in a partially enclosed chamber. It has been found that any carbon monoxide produced will be oxidised completely to carbon dioxide in the heated enclosure. Further, the oxides of the metals used in coring are deposited on the inside of the cylinder and do not escape into the room as with the ordinary type of arc. The presence of any dangerous concentration of CO in a room in which a carbon arc is run has not so far been reported, and probably ventilation would have to be very inefficient for such conditions to develop; but the fumes of oxide from metallic and cored metallic arcs have been found unpleasant when prolonged treatment is employed as in a hospital or clinic.

To summarise: the Kandem arc is a new development employing carbon or cored carbon arcs. The arc is of high efficiency, giving a large output of ultra-violet radiation for the power consumed. The steadiness of running results in a very uniform intensity, a point of much importance in therapeutic work. The lamps are made to work on D.C. and A.C. supply, and in two sizes for 6 and 24 amps. respectively.

GUIDE TO CURRENT OFFICIAL STATISTICS.

THE ninth volume of this guide, which covers the whole of the statistical information contained in official publications in 1930 by government departments in Great Britain and Northern Ireland, has just been issued and may be obtained from H.M. Stationery Office (1s.). It is issued by the Permanent Consultative Committee on Official Statistics, London, and its object is to direct the inquirer to all official publications that contain statistics bearing on the particular subject with which he is concerned, and more especially to inform him of the nature of the statistics he will find in the volumes to which he is referred—i.e., the mode of analysis and the time and place to which they relate. There are two distinct sections in the book: (1) An alphabetical subject index with indicating numbers, and (2) a list of publications in numerical order.

"HIDDEN POWER."

Dr. Charles Russ's play, called "Hidden Power," is being presented again in London by the Warwick James repertory company. It is a drama full of medical interest, for its opening (and only) murder is committed by the anæsthetist during an operation, and his guilt is subsequently discovered by hypnosis. This gives Dr. Russ a good opportunity for discussing, through his characters, some important aspects of mind and body, and he makes suggestive comments on psychological analysis as practised by doctors and clergy. At the same time he contrives a number of startling situations, and at moments of crisis in the consulting room it is soothing to refer to the programme and find the names of well-known surgical instrument makers in place of the usual "wigs by Clarkson." It must be admitted, however, that the play lacks surprises, and it certainly requires ruthless compression. It only begins to live in the *third* act, and the fifth betrays its origin in an afterthought. Perhaps we could not reasonably expect the heroine's little son to have grown in stature since we first met him two years before; but he still seemed deplorably young for his original age.

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[1] Münch. med. Woch., July 3rd, p. 1144.

The play is to be seen at King George's Theatre, Caroline Street, Great Russell Street, London, W.C.1, until the end of this week.

DIETETICS.

A WORK [1] whose author endeavours to omit all medical details and yet to deal with a most important branch of therapeutics must suffer from certain limitations. This one is easily understandable by the layman, but as the layman is not likely to be so unlucky as to suffer simultaneously from acute colitis, constipation, diabetes, dysentery, gastric ulcer, gout, hypertension, and obesity, it must necessarily tend to tempt him to take an undue interest in subjects which are not his concern. If, on the other hand, it is intended for the medical man, he is bound to be somewhat disappointed to find the dietary for gastric ulcer, for example, confined to Leuber's diet or Panzalt's diet, neither of which is frequently advocated in this country. The diets laid down with the dogmatism of capital letters in such conditions as hypertension, gastritis, and rheumatism lack scientific support. For these reasons we are unable to commend the book.

THE MEDICAL DIRECTORY.

Messrs. J. & A. Churchill write: "The annual circular has been posted to each member of the medical profession. If the form has not been received, a duplicate will be sent on request. We shall be grateful for the return of the forms by an early post."

SULPHUR TREATMENT of G.P.I.—Commenting on the opening sentence of an annotation on this subject in THE LANCET last week (p. 200), Mr. J. E. R. McDonagh points out that he was using organic compounds of sulphur in the treatment of G.P.I. in 1916 [2]—that is nine years before sulphur was suggested as a pyrexial agent in substitute for malaria.

Appointments

FLETCHER, E., M.B. Camb., M.R.C.P. Lond., has been appointed Assistant Physican to the Queen Mary's Hospital for the East End.

SAVIN, L. H., M.D. Lond., M.R.C.P. Lond., F.R.C.S., Junior Ophthalmic Surgeon to King's College Hospital.

STOTT, W., M.B., B.S. Durh., D.P.H., Medical Officer, Southwark.

Certifying Surgeons under the Factory and Workshops Act: HARRISON, C. B., L.R.C.P., L.R.C.S. Irel. (Youlgreave, Derby); HENDERSON, W. (Burgess Hill, Sussex); SCOTT, W. J., M.B., Ch.B. Glasg. (Annbank, Ayr); TAYLOR-JONES, T. H. E. (Tenderden, Kent).

Vacancies

For further information refer to the advertisement columns.

Accrington, Victoria Hospital.—H.S. £150.

Altrincham General Hospital.—Sen. and Jun. H.S. At rate of £150 and £100 respectively.

Ashton-under-Lyne, District Infirmary.—H.S. At rate of £150.

Bangor, Carnarvonshire and Anglesey Infirmary.—H.S. £200.

Barnsley, Beckett Hospital and Dispensary.—H.P. £200.

Barnstaple, North Devon Infirmary.—Res. M.O. £150.

Bath, Royal United Hospital.—Sen. H.S. At rate of £175.

Bedford County Hospital.—Asst. H.S. At rate of £130.

Benenden, Kent, National Sanatorium.—Res. Asst. M.O. £300.

Birkenhead Infirmary and Institution, Tranmere.—Res. Asst. Med. Supt. £450.

Birmingham, Midland Hospital, Easy-row.—H.S. £150.

Bolingbroke Hospital, Wandsworth Common, S.W.—Res. M.O. £200.

Bootle General Hospital, Nr. Liverpool.—H.P. At rate of £150.

Bradford, City.—Asst. School Dental Surg. £475.

Bradford, Municipal General Hospital, St. Luke's.—H.P.'s and H.S.'s. Each at rate of £200.

Brighton, Royal Sussex County Hospital.—Cas. H.S. £120.

Brighton, Sussex Eye Hospital.—Hon. Clin. Asst.

Bristol General Hospital.—H.P. At rate of £80.

Bristol, Stoke Park Colony.—M.O. £600.

Cambridge, Addenbrooke's Hospital.—Res. Anæsthetist and Emergency O. Also H.P. Each at rate of £130.

Cancer Hospital, Fulham-road, S.W.—Physiological Chemist. £600.

Chesterfield and North Derbyshire Royal Hospital.—H.S. At rate of £150.

City of London Hospital for Diseases of Heart, and Lungs, Victori Park, E.—Registrar.

Coventry and Warwickshire Hospital.—Res. H.P. and Res. Cas. O. £160 and £125 respectively.

Dewsbury County Borough.—Deputy School M.O., &c. £600.

Doncaster, Royal Infirmary.—H.P. At rate of £175.

Downpatrick, Northern Ireland, Down Mental Hospital.—Asst. M.O. £300.

Dudley, Guest Hospital.—H.S. Also Asst. H.S. £200 and £1 respectively.

East Ham, County Borough of.—Asst. M.O. £500.

Elizabeth Garrett Anderson Hospital, Euston-road.—Clin. Asst

Evelina Hospital for Children, Southwark, S.E.—H.S. At rate £120.

Great Yarmouth General Hospital.—H.S. £140.

Hove, Lady Chichester Hospital.—Jun. H.P. At rate of £5

Huddersfield Royal Infirmary.—H.S. At rate of £150.

Hull Royal Infirmary.—H.P. to Sutton Branch. £160.

Ipswich, East Suffolk and Ipswich Hospital.—4 H.S.'s an 1 H.P. Each £120.

Leeds Hospital for Women.—H.S. At rate of £100.

Liverpool, Royal Children's Hospital.—Res. M.O. Also Secon Res M.O. At rate of £180 and £120 respectively.

Leicester Royal Infirmary.—H.S.'s and H.P. Each £125.

Liverpool Heart Hospital.—Hon. Asst. Phys.

London University, S.W.—University Readership in Patholo £800.

Lurgan Union, Northern Ireland.—M.O. £300.

Manchester, Ancoats Hospital.—Res. M.O., £150. H.P., and Orthopædic H.S. All at rate of £100. Also Pathologist (Part-time) £200.

Manchester, Hulme Dispensary.—Res. M.O. £300.

Manchester, Northern Hospital for Women and Children. Sen. H.S. and Jun. H.S. £130 and £100 respectively.

Manchester Royal Infirmary.—Asst. Res. M.O. and Res. Pathologist. £100.

Manchester Royal Eye Hospital.—Jun. H.S. £120.

Manchester and Salford Hospital for Skin Diseases.—H.S. rate of £100.

Margate Royal Sea Bathing Hospital for Surgical Tuberculo H.S. At rate of £200.

Marseilles, Queen Alexandra Memorial Hospital.—Res. £250.

Mount Vernon Hospital, Northwood.—H.S. At rate of £1

Nottingham General Hospital.—Cas. O. At rate of £2

Nottingham and Midland Eye Infirmary.—Res. H.S. £2

Plymouth Mental Hospital, Blackadon.—Deputy Med. £500.

Preston, Sharoe Green, Hospital, Fulwood.—Jun. Res. M.O.

Preston and County of Lancaster, Royal Infirmary.—Surg. £300.

Princess Louise Kensington Hospital for Children, Kensington, W.—Clin. Asst.

Queen Mary's Hospital for the East End, E.—Hon. Ophth.

Rainhill, Lancs County Mental Hospital.—Locum Te 7 gns. weekly.

Reading, Royal Berkshire Hospital.—Res. Anæsthetist. At of £150.

Rotherham Hospital.—Sen. H.S. £200. Cas. H.S. £150. H.P. £180.

St. Giles Hospital, Brunswick-square, S.E.—Asst. M.O.

St. Leonards-on-Sea, Buchanan Hospital.—Jun. H.S. £1

Salford, Hope Hospital.—Res. M.O. £400.

Sheffield Royal Hospital.—Ophth. H.S. Also Anæsthe £120 and £80 respectively.

Sheffield Royal Infirmary.—Asst. Aural and Ophth. H.S. H.S. and Second Asst. Cas. O. Each at rate of £80.

Southampton, Borough Isolation Hospital.—Res. M.O. £

Swansea General and Eye Hospital.—H.P. £150.

Walsall General Hospital.—H.P. and H.S. (Women). Each rate of £150.

Walsall Manor Hospital.—Asst. M.O. £150.

West Bromwich and District General Hospital.—H.S., H.P. an Cas. H.S. Each at rate of £200.

Westminster Hospital, Broad Sanctuary, S.W.—Wander Scho and Reg. to Children's Dept. £250.

Woolwich and District War Memorial Hospital, Shooters H S.E.—H.S. At rate of £100.

Wolverhampton and Midland Counties Eye Infirmary.—H.S. £1

Wolverhampton Royal Hospital.—H.S. for Women's Hosp. £1

The Chief Inspector of Factories announces vacancies f Certifying Factory Surgeons at Littleport (Cambridg and at Worthing (Sussex).

Births, Marriages, and Deaths

BIRTHS.

BATEMAN.—On July 23rd, at "Redlynch," Cooden, Bexhil the wife of Dr. C. E. Gooderson Bateman, of a son.

MOLESWORTH.—On July 20th, the wife of H. W. L. Molesworth, F.R.C.S., of a daughter.

TROUP.—On July 23rd, at The Farm House, Stonebridge, N.W.10, to Jean, the wife of Arthur G. Troup, M.D., D.P.H. —a son.

DEATHS.

HILLIER.—On July 25th, after a short illness, Thomas Ernest Hillier, M.A., M.B. Camb., aged 71 years.

SMITH.—At a nursing home in Sheffield, Charles William Smith, M.B., F.R.C.S., aged 53.

WATSON.—On July 27th, at Rainhill, Liverpool, George Alfred Watson, M.B., C.M. Edin., late Pathologist, Lancs Mental Hospitals Board.

N.B.—A fee of 7s. 6d. is charged for the insertion of Notices of Births, Marriages and Deaths.

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[1] The Diet Book, for Doctor, Patient, and Housewife. By Marguerite Requa Rea. London: Oxford University Press, Humphrey Milford. 1931. Pp. 197. 7s. 6d.

[2] See THE LANCET, 1916, i., 236 and 863; also McDonagh, J. E. H., Venereal Diseases, London, 1920, p. 158.

ADDRESSES AND ORIGINAL ARTICLES

ON VACCINE THERAPY AND IMMUNISATION IN VITRO.

BY SIR ALMROTH WRIGHT, K.B.E., C.B., M.D., D.SC. DUB., F.R.S.,

PRINCIPAL OF THE INSTITUTE OF PATHOLOGY AND RESEARCH, ST. MARY'S HOSPITAL; PROFESSOR OF EXPERIMENTAL PATHOLOGY IN THE UNIVERSITY OF LONDON.

(*Continued from p. 230.*)

Antibacterial Power of Blood.

I ACCORDINGLY set myself to devise methods for measuring, first, the hæmobactericidal power exerted y the blood and its population of leucocytes upon erophytic organisms such as the staphylococcus, treptococcus, pneumococcus, and the tubercle bacillus. he problem I set myself here was to find, not a ethod of explantation to tell us what number of erophytic microbes are killed off without residue, ut a method of inculturing to tell us what percentage enumerated microbes implanted would grow out to colonies in the blood. The reason why the one nd not the other kind of method is required to easure the effect exerted by the blood by serophytes ll presently be apparent.

The slide cell method which makes use of defibri-ted blood was one of the methods of inculturing vised for this purpose. It is illustrated in Figs. 1 d 4, and is one of the methods put to use by Fleming his experiments on the action of antiseptics.

A second method devised for the same purpose the following:

Graduated implantations of microbes are made into coagulated instead of into defibrinated blood, and the planted blood volumes are then drawn up into capillary bes. After overnight incubation the capillary clots are own out, are treated with 1 per cent. saponin, and are then ng up in water until their colour is completely discharged. hey are then dried and stained, and the colonies are umerated under the microscope.

his, of course, gives—in particular in the case when e colonies are close-packed—a more accurate numeration than the naked-eye observation which e trust to in the slide-cell method. It also gives us ndications as to the rôle which phagocytosis plays n the killing of microbes. For the colonies found n the clots can be ranged into three classes: *naked olonies*—i.e., those which are not surrounded by eucocytes; *ringed colonies*, colonies surrounded with eucocytes; and what we may call blind, blank, or *obliterated colonies*—i.e., aggregations of leucocytes surrounding a presumably extirpated bacterial colony.

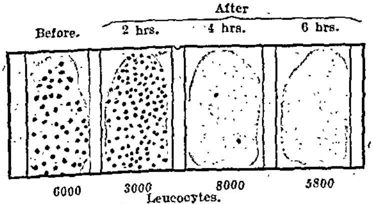
A third method—and this differs from the second only in the mode of implantation—is the "wash and afterwash" method. Here we draw up into a long capillary tube, first as a forerunner, a diluted bacterial culture, and then follow on with 10 equal volumes of blood separated off in each case by a bubble of air.

I will now relate what these methods have taught us about immunisation and the killing of serophytic microbes by the blood. Let me first explain the following points:

To begin with, the normal serum constitutes a very excellent culture medium for the class of microbes we are here considering. The same holds of the plasma. This, since the plasma is always full of blood-platelets, means incidentally that these formed elements also can here be dismissed from consideration. Further, the red corpuscles can, in appraising the bactericidal powers of the blood, be neglected. That follows by the fact that deleucocyted blood—i.e., the mixture of red corpuscles and serum which is obtained by passing blood through a close filter[12]—is as good a culture medium for serophytes as clear serum. It follows from this galaxy of premises that the bactericidal action which is exerted by a blood upon serophytic microbes is neither more nor less than the bactericidal action exerted by its population of leucocytes.

The next issue which comes up in connexion with the killing of serophytes by leucocytes is that as to whether these microbes are killed exclusively by phagocytosis followed by intracellular digestion; or whether they are killed also, and if so to what extent, extracellularly by bactericidal elements elaborated by the leucocytes and excreted by them into the serum.

FIG. 4.



Coli vaccine, 200 millions (intravenously). Tested in a slide cell by implanting 225 streptococci into 50 c.mm. of blood.

Important data which have, as we shall see later, a bearing upon this question, are furnished by a study of the event of adding graduated quanta of serophytic microbes to equal volumes of blood.

FUNDAMENTAL EXPERIMENTS.

I have already published experiments bearing on this question. But it will be convenient to give a concrete illustration of what happens when my blood (it is a blood of somewhat low staphylobactericidal power) is implanted with different quanta of staphylococcus. I subjoin protocols of two typical experiments confining myself for the moment to experiments carried out in slide cells.

Expt. 27.7.22.—Forty c.mm. volumes of A. E. W.'s defibrinated blood implanted with different quanta of staphylococcus culture and cultured in slide cells. (Table I.)

Expt. 1.8.22.—Graduated dilutions of staphylococcus culture were implanted into measured volumes of A. E. W.'s blood. The blood was then tested by two observers. (Table II.)

The explanation of the fact that the implanted microbes are here in no instance killed off without residue is furnished by the consideration that extracellular killing involves close proximity, and phagocytosis actual contact, between the microbes and leucocytes. In connexion with these requisites attention must be given to the following series of facts: (1) there are always in the blood large areas unoccupied by leucocytes (the volume of the contained leucocytes stands to the volume of the containing blood in the ratio of about 1 to 300); (2) these regions are for the major part leucocytically unpatrolled or very ineffectively patrolled; and (3) since it can, by appropriate experiments, be shown that leucocytes are insensitive to the feeble chemotatic stimuli which emanate from single microbes, the finding of isolated leucocytes by microbes must—even in patrolled areas in the blood—be a matter of chance. In other words, it depends upon the microbe happening to lie directly in the path taken by the leucocyte.

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[12] Wright, A. E.: THE LANCET, 1926, i., 4.; Fleming, A.: Brit. Jour. Exper. Path., 1926, vii., 281.

TABLE I.

Approximate number of staphylococci implanted.*		No. of colonies which developed.	Percentage of microbes that survived.
Per c.cm.	Per 40 c.mm.		
6,400	256	95 96 }95½	39
3,200	128	57 53 }55	43
1,600	64	34 26 }30	47
800	32	19 11 }15	46
400	16	11 12 }11½	72

* The number of microbes implanted was here and in all the experiments which follow deduced from the number of microbes which grew out into colonies in serum.

TABLE II.

Observer A. E. W.

Implantation per c.cm. of blood.	No. of microbes implanted into 40 c.mm. of blood.	No. of microbes which developed into colonies.	Percentage of survivors.
8,400	336	64	19 }21·2
4,200	168	28	17
2,100	84	24	28
1,050	42	7·5	18
525	21	11·5	55
262	10½	5	50
131	5	5	}140
66	3	7	
33	1·5	1·5	
	671	153	22·8
Observer L. C.			
9,600	384	74	19 }23·7
4,800	192	44	23
2,400	96	27	28
1,200	48	13	27
600	24	15	63
300	12	6	50
150	6	5	}114
75	3	5	
38	1·5	2	
	766	191	24·9

The fact that with larger and larger implantations larger and larger numbers of microbes are killed, shows that the blood develops under the impulsion of microbic stimulation increased bactericidal power.

INTERPRETATION OF THE DATA.

From this then follows the important principle that our methods of hæmobactericidal measurement are not in the same category as quantitative chemical tests. They are, in reality, biological tests; tests which tell us not what amount of bactericidal energy is actually resident in a sample of blood, but what bactericidal energy can, under the impulsion of microbic stimulation, be developed in that blood. In other words, they are comparable to tests made to find out what amount of muscular power can, under stimulation, be put forth by a muscle.

It is pertinent to note in passing that the general principle of which we have illustration here may hold true, not only of bactericidal, but also of opsonic power. It is conceivable that the values for opsonic power which are registered when microbes are incubated with a mixture of serum and leucocytes may represent, not as hitherto assumed, the native opsonic power of the serum, but native opsonic power supplemented by opsonins excreted into the serum by leucocytes under the impulsion of a microbic stimulus. Experimental data which bear upon this question will come up for consideration later. For the moment it will suffice to point out that by centrifugalising instead of incubating a phagocytic mixture, and by conducting our phagocytic operations at the temperature of the air instead of at blood heat, we can reduce the exposure of the leucocytes to microbic stimulation to a minimum.[13]

The Immunising Response.

Now that our measurements of the bactericidal power of the blood have brought us face to face with the conception of immunising response to the inoculation of microbes into the blood in vitro it will be appropriate to explain the genesis of that idea.

My first experiments on the question of immunising response made by the blood were prompted by th fact already mentioned that we had, despite strenuo experimental search, failed to find any indicatio of the production of antibacterial substances by the fixed tissues. In view of that I performed the following experiment:—

> Having placed double ligatures loosely round the jugu vein of a rabbit and having tied off all tributaries, vacc was introduced into the vein of the opposite ear, and the upon the double ligatures were drawn tight so as to iso a portion of the vaccinated blood within the jugular ve At the same time a sample of the vaccinated blood withdrawn from the carotid and was placed in the incub

Experiments of this kind showed that the antibacte response was obtained, not only in the circulati blood, but also in the blood isolated in the vein; and in addition in the blood which was isolated and incubated in vitro.

These experiments were followed by others in whic graduated doses of a staphylococcus and also of streptococcus vaccine were added to my own bloo in vitro. The inoculated samples of blood were the incubated for six hours and afterwards the ser were pipetted off, and then using the "wash and afterwash" procedure 10 volumes of each serum were implanted with a mixture of staphylococci and streptococci. The separate volumes of serum in question were then, after overnight incubation, explanted upon agar. These experiments showed (*a*) that the serum of blood implanted with an appropriate dose of a staphylococcus or streptococcus vaccine becomes bactericidal to both species of microbe; and, further (*b*) that the sera of the bloods implanted with an overdose of vaccine furnish, as compared with the serum of the uninoculated blood, a more favourable culture medium for both kinds of microbe.

The next important step undertaken—but this had to wait until the slide cell and other hæmobactericidal methods had been devised—was to investigate, as we have just done, the effect of adding graduated quanta of serophytic microbes to the blood.

IMMUNISING RESPONSE IN VITRO.

I have now, for 12 and more years, experimented continuously upon the immunising response of blood in vitro.

In addition to examining for augmented and educed bactericidal power in the blood taken as a hole, I have analysed the results which relate to this y chiastic bactericidal experiments. Further, I ave searched for augmented and reduced bactericidal ower in the serum—I use here the term reduced s well as the term augmented for the reason that he normal serum, though it is as good a culture nedium for staphylococci as nutrient broth, urnishes, there is reason to think, less than 100 olonies for 100 implanted staphylococci. I have urther looked for increased and decreased phagocytic esponse; for increased and diminished opsonic ower; and for negative and positive changes in the hagocytic avidity of the leucocytes—keeping n view all the time the problem of the rôle played y each of these items in the general bactericidal ower of the blood.

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[13] *Fleming*: On Wright's Centrifuge Method of Estimating Phagocytosis, Brit. Exp. Path., 1927, viii., 50.

I have employed also as antigens, both living and lead, and in some cases, autolysed microbes, testing he resulting immunising response upon both homoogous and heterologous cultures.

Moreover, I have experimented upon the blood before clotting, upon coagulated blood, upon defibrinated blood, and upon isolated leucocytes—either eucocytes which had emigrated from the blood, or eucocytes separated by centrifugalisation.

Again, I have brought living or dead vaccines nto operation sometimes by incorporating them into he blood; and at other times by placing a blood ontaining vaccine upon or side by side with a blood ontaining a test-quantum of microbes (*Method of Felded Clots*); and, finally, I have—and this is also n effective method of vaccination—inoculated the eucocytes intracellularly. The procedure here in uestion (I call it the '*baiting method*') consists in aking two samples of blood, giving the leucocytes n one sample, a somewhat sparse phagocytic meal f microbes; and then supplying, after an interval f incubation, both the fed and the unfed populations f leucocytes with a full phagocytic test-meal.

In view of the wide domain covered by these experiments, I must confine myself to setting out here only the most important experimental findings.

Let me begin with the results of the chiastic experiments.

Expt. I., 29.8.23.—Simple bactericidal experiment in slide cells and also chiastic experiment. (Observer—L. C.). (Tables III. and IV.).

TABLE III.—*Hæmobactericidal Experiment.*

Tests of samples of blood before and after inoculation in vivo.

No. of staphylococci implanted	747	249	83
	No. of colonies which developed.		
Blood A	13	5	1
Blood B	4	4	2

TABLE IV.—*Chiastic Slide Cell Bactericidal Tests.*

No. of staphylococci implanted	420	140
	No. of colonies which developed.	
Corpuscles of Blood—		
(A) with serum of Blood (A)	27	11
(B) " " (B)	9	2·5
(A) " " (B)	16·5	9·5
(B) " " (A)	8·5	5·0

Blood B.—Index of hæmobactericidal efficiency 3·3; index of the bactericidal efficiency of the serum, 1·45; index of bactericidal efficiency of the leucocytes, 2·8.

Female student inoculated with 1000 million staphylococci subcutaneously. Blood A taken before the inoculation; Blood B four hours after. Both bloods were tested with three different suspensions of staphylococcus—2·5 c.mm. of each being added in each case to 50 c.mm. of blood.

Expt. II.—Inoculation in vitro.—A 100 c.cm. volume of R. T. M.'s unvaccinated defibrinated blood, and also a 100 c.mm. volume of his blood vaccinated with 1,000,000 of dead staphylococci per c.cm. The bloods were then incubated for one hour. After that the sera were pipetted off and the corpuscles washed in saline. Then in each case one volume of washed corpuscles was mixed with one volume of serum, and then 50 c.mm. volumes of each mixture were implanted with one-twentieth volume of graduated dilutions of staphylococcus culture. The implanted bloods were then cultivated in slide cells. (Table V.).

TABLE V.—*Chiastic Slide Cell Bactericidal Tests.*

No. of staphylococci implanted ..	736	368	184	92	66
	No of colonies which developed.				Total.
Serum and corpuscles of Normal blood ..	25	12	5	4	46
Serum and corpuscles of Vaccinated " ..	36	19	9	7	71
Serum of normal and corpuscles of vaccinated blood	54	20	15	6	95
Serum of vaccinated and corpuscles of normal blood	12	6	3	2	23

Vaccinated Blood.—Index of hæmobactericidal efficiency, 0·64; index of the bactericidal efficiency of the serum, 2; index of the bactericidal efficiency of the leucocytes, 0·5.

The results, you will see, of these experiments are inconclusive as to the relative importance of the part played by the leucocytes and the serum in the general bactericidal effect.

I must therefore pass on to other experiments. And let me, in order that these may be followed properly, point out that the number of serophytic microbes killed by the blood is determined largely by the disposition of the population of leucocytes relative to the population of microbes, and this disposition is, of course, modified by every physical force that comes into operation upon the blood.

The forces which here require to be considered are: (*a*) the force of gravity; (*b*) the compressional force exerted by the contraction of the clot; (*c*) the effect of centrifugalisation respectively upon uncoagulated, defibrinated, and coagulated blood; and (*d*) the spontaneous movements of the leucocytes.

With regard to the effect of gravity this comes into consideration in particular when we are operating with defibrinated blood. For here the red corpuscles and leucocytes settle to the bottom; and the microbes are left floating in the supernatant serum. They are there safe from phagocytic attack, and can, if the serum continues to be non-bactericidal there develop into colonies.

The spontaneous contraction of the clot influences the results by bringing closer together the leucocytes and microbes which were in the unclotted and freshly clotted blood comparatively far apart. In connexion with this it will be recalled that half the volume of blood consists of fluid—and that this in the unretracted clot forms pools in which the microbes are, as in the supernatant serum of defibrinated blood, safe from phagocytic attack. The degree to which an individual clot is compacted by the spontaneous retraction of the fibrin meshwork depends, of course, upon all sorts of variable and incalculable factors.

Centrifugalisation—we may consider first the centrifuging of uncoagulated or defibrinated blood—altogether alters the distribution of the leucocytes in those bloods. When uncoagulated blood is centrifuged the large mononuclear leucocytes and the lymphocytes are brought to the surface, and are with a proportion of the blood-platelets agglomerated into a leucocytic cap. Most of the polynuclear leucocytes are assembled immediately underneath. When defibrinated blood is centrifuged for a long period (let us say, a quarter of an hour) in a high speed centrifuge, the polynuclear leucocytes are brought to the top. When microbes are implanted into serum or plasma or are implanted into blood which does not make immunising response, the microbes are not carried down in full proportion by ordinary centrifuging. Many are left in suspension in the supernatant fluid.

When a coagulated blood is centrifuged the clot is, of course, compacted, the lacunæ are abolished, and in the case of an implanted blood the microbes and leucocytes are brought into much closer proximity than in the uncompacted clot.

The results obtained by the centrifugalisation of implanted capillary clots furnish a striking manifestation of the influencing of the hæmobactericidal effect by mechanical factors.

Expt. 7.11.28. Comparison of Packed and Unpacked Blood and Slide Cells.—Four 50 c.mm. volumes of R. M. F.'s blood implanted with an 1800-fold and four others with a 600-fold dilution of staphylococcus, 2·5 c.mm. of staphylococcus dilution being added to each 50 c.mm. of blood. The implanted bloods were then filled into capillary tubes and were kept in the incubator for six minutes to allow time for clotting and for the separation of the clot. Then two tubes from each set of four were centrifuged for two minutes at full speed in the electric centrifuge. All the capillary tubes were then incubated for 18 hours. The clots were then decolorised and the anaerobic colonies in them were counted.

Four 50 c.mm. volumes of defibrinated blood to which the same addition of staphylococcus had been made were then cultured in slide cells. Higher dilutions of staphylococcus were enumerated in slide cells in watered blood. (Table VI.)

TABLE VI.

No. of staphylococci implanted	520	1560
	No. of colonies which developed.	
Defibrinated blood in slide cells	30 52 43 46 }43	93 121 114 111 }110
Unpacked capillary blood-clots	48 40 }44	124 129 }126½
Packed capillary blood-clots . .	4 3 }3½	11 48 }29½

Expt. 16.11.27.—Similar experiment and technique to above. (Table VII.)

TABLE VII.

—	Volume of staphylococcus implanted.		
	1/18 Wash.	⅛ Wash.	¼ Wash.
	No. of colonies which developed.		
Defibrinated blood in slide cells	48 38 }43	113 108 }111	∞ ∞ }∞
Unpacked capillary blood-clots	15 13 }14	39 65 }52	149 225 }187
Packed capillary blood-clots . .	0 2 }1	0 0 }0	32 16 }24

Having got these preliminary matters out of our way we may consider the outcome of repeating the fundamental experiments, varying however the technique, in using here for our implantation instead of defibrinated blood or blood fresh from the circulation, leucocytes derived from centrifuged blood suspended in serum. The following protocols of experiments show that we obtain when we operate with leucocytic suspensions exactly the same results as when we operate with the whole blood.

Expt. 31.10.30.—A. E. W.'s blood. Citrated blood was prepared by adding ½ per cent. of citrate of soda to 50 c.mm. volumes of blood. The blood samples were then centrifuged in capillary tubes and the plasma was pipetted off. The capillary tubes were now cut across immediately below the leucocytic cap and the agglomerated leucocytes dispersed in 30 c.mm. of serum. These serum suspensions of leucocytes were then implanted with, in each case, 5 c.mm. of a diluted staphylococcus culture, and were then incubated in capillary tubes disposed nearly horizontally. Similar quanta of staphylococcus were, for purposes of enumeration, implanted into leucocyte-free serum. (Table VIII.)

TABLE VIII.

Dilution of staphylococcus implanted.	No. of colonies which developed in a leucocyte-free serum.	No. of colonies which developed in the leucocytic suspension.	Percentage of survivors.
Staph./100,000	8 8 } 8	10 8 }9	100
Staph./50,000	16 17 }16·5	2 2 }2	12
Staph./25,000	33	6 4 }5	15·5

Expt. 7.11 30.—50 c.mm. volumes of R. H.'s blood were centrifuged after the addition of ½ per cent. citrate of soda. The plasma having been pipetted off the leucocytes composing the leucocytic cap were dispersed in 30 c.mm. of serum and these suspensions were implanted with one-tenth of their volume of graduated dilutions of staphylococcus, and were then incubated in capillary tubes disposed nearly horizontally. (Table IX.)

TABLE IX.

Dilution of staphylococcus implanted.	No. of microbes implanted into each volume of leucocytic suspension.	No. of colonies which developed in each tube.	Percentage of survivors.
Staph./200,000	} 25	1 1 }1	4
Staph./100,000	} 50	0 1 }0·5	1
Staph./50,000	} 100	1 2 }1·5	1·5
Staph./2500	} 2000	9 7 }8	0·4

Expt. 5.11.30.—R. T. M.'s blood. Leucocytic suspension made by suspending the leucocytes from 50 c.mm. of centrifuged blood in 15 c.mm. of serum.

TABLE X.

No of microbes implanted.	No. of colonies which developed.	Percentage of survivors.
36	9 12 }10½	28
72	20 18 }19	26
144	18 18 }18	12
288	58 30 }44	15
576	60 5 }59	10

Expt. 3.12.30. R. M. F.'s blood.—Graduated implantations of staphylococcus into a weak leucocytic suspension.

Leucocytic suspension prepared in bulk from R. M. F.'s citrated blood and diluted with serum to one-eighth standard; 2½ c.mm. volumes of staphylococcus dilutions were then implanted into 20 c.mm. of this leucocytic suspension—in triplicate and the suspensions were then incubated as above. Five counts made of 1/30,000 dilution in normal serum. (Table XI.)

We pass now to other experiments in which we employ, as before, graduated quanta of microbes, and operate again upon blood or separated leucocytes; but we now arrange our experiments so that the acquirement of bactericidal power of the serum and the effect exerted by it shall be separately manifest.

The simplest and most obvious way of achieving this is to bring the vaccine of dead or living microbes into operation upon the blood, to incubate the clots, and then pipette off the serum and test it by implanting it with *very small* numbers of living microbes.

TABLE XI.

Dilution of staphylococcus.	Count.	Calculated implant.	Colonies developed.	Percentage of survivors.
$\frac{\text{Staph.}}{1000}$	—	720	246 272 } 259	36
$\frac{\text{Staph.}}{3000}$	—	240	72 90 98 } 87	36
$\frac{\text{Staph.}}{10,000}$	—	72	32 33 22 } 29	40
$\frac{\text{Staph.}}{30,000}$	18 29 18 30 26	24	8 6 22 } 8	33
$\frac{\text{Staph.}}{100,000}$	—	7	5 6 7 } 6	86

Similar experiment and technique as above, 4.12.30.

Dilution of staphylococcus.	Count.	Calculated implant.	Colonies developed.	Percentage of survivors.
$\frac{\text{Staph.}}{10,000}$	91 81 103 93 78	89	6 3 12 4 } 6¼	7
$\frac{\text{Staph.}}{20,000}$	—	44	8 6 8 4 } 6½	14·8
$\frac{\text{Staph.}}{40,000}$	20 14 24 32	22¼	4 5 2 15 } 6½	29
$\frac{\text{Staph.}}{80,000}$	—	11	1 6 3 5 } 3¾	34
$\frac{\text{Staph.}}{160,000}$	—	6	3 3 2 1 } 2¼	37·5

The two following experiments are of this kind:—

Expt. 17.12.30. A. E. W.'s blood.—5 c.mm. of salt lution or diluted staphylococcus culture were incorporated to 50 c.mm. volumes of blood, and the bloods were then cubated for 20 minutes. After this they were centrifuged nd the sera pipetted off and tested by the Wash and After-ash method—the forerunner volume being here a 10 c.mm. blume of $\frac{\text{Staph.}}{1000}$ and the after-runner volumes three 5 c.mm. olumes of serum. The results were as shown in Table XII.

TABLE XII.

—	No. of colonies which developed in the three after-runner volumes.			Total.
	1	2	3	
Serum from control blood ..	27 26	20 27	13 15	60 68 } 64
Serum from blood implanted with—				
320 staph. per c.cm. ..	30	25	13	68
640 staph. per c.cm. ..	30	24	1	55
1290 staph. per c.cm. ..	23	16	10	49
2560 staph. per c.cm. ..	18	12	0	30

Calculation shows that here, in the most favourable case, the 15 c.mm. of serum here used acquired sufficient bactericidal power to kill at the rate of 2500 staphylococci per c.cm.

Expt. 2.12.30. A. E. W.'s blood.—50 c.mm. volumes of blood centrifuged after clotting. The sera were drawn off and were, after addition of Tuberculin B.E., reimposed upon the clots. After 24 hours' incubation the sera were a second time drawn off, and were tested by the Wash and Afterwash method, using a 5 c.mm. volume of $\frac{\text{Staph.}}{1000}$ as a forerunner and three 5 c.mm. volumes of serum as after-runners. (Table XIII.)

TABLE XIII.

—	No. of colonies which developed in the three after-runner volumes.			Total.
	1	2	3	
Control normal serum ..	24 34	15 13	4 6	43 53 } 48
Serum containing—				
$\frac{\text{B.E.}}{2000\text{ million}}$	13 21	7 6	4 4	24 31 } 27½
$\frac{\text{B.E.}}{1000\text{ million}}$	17 14	9 8	0 0	26 22 } 24
$\frac{\text{B.E.}}{500\text{ million}}$	18 22	3 12	2 3	23 37 } 30
$\frac{\text{B.E.}}{100\text{ million}}$	13 9	2 4	0 4	15 17 } 16
$\frac{\text{B.E.}}{50\text{ million}}$	15 16	8 5	5 0	28 21 } 24½
$\frac{\text{B.E.}}{25\text{ million}}$	8 9	10 3	7 2	25 14 } 19½

Calculation shows that here again in the most favourable cases the serum acquires sufficient bactericidal power to kill just over 2000 staphylococci per c.cm.

Expt. 21.3.30.—100 c.mm. volumes of A. E. W.'s uncoagulated blood implanted with 10 c.mm. of normal salt solution or staphylococcus culture were incubated for 25 minutes, and then centrifuged. The sera were now pipetted off. 5 c.mm. volumes of a 50,000-fold diluted staphylococcus culture were added in each case to 40 c.mm. of serum. (Table XIV.)

TABLE XIV.

—	No. of colonies which developed.
Serum of control blood .. .. (1)	51
(2)	50
Serum from blood vaccinated with—	
5 staph. per c.c.	39
50 staph. per c.c.	15
500 staph. per c.c.	22
1,000 staph. per c.c.	17
2,000 staph. per c.c.	17
5,000 staph. per c.c.	12
20,000 staph. per c.c.	26

The serum here killed off, at the best, 950 staphylococci per c.cm.

Another way of studying the effect of the serum separately is illustrated by the next two experiments.

Expt. 9.12.30. A. E. W.'s blood.—50 c.mm. volumes of blood centrifuged after clotting in capillary tubes. The sera were then drawn off, 2·5 c.mm. of diluted staphylococcus culture were added to each volume of serum, and the sera were then replaced on the clots and lightly centrifuged. The containing tubes were then disposed almost horizontally and incubated overnight. (Table XV.)

TABLE XV.

Dilution of staphylococcus culture implanted.	No. of microbes implanted into each volume of serum.	No. of colonies which developed.	Percentage of survivors.
$\frac{\text{Staph.}}{160,000}$	6	6 4 } 5	84
$\frac{\text{Staph.}}{80,000}$	12	2 6 } 4	32
$\frac{\text{Staph.}}{40,000}$	25	9 17 } 13	48
$\frac{\text{Staph.}}{20,000}$	50	21 19 } 20	40
$\frac{\text{Staph.}}{10,000}$	100	55 21 } 38	38

Calculation shows that here the serum in the most favourable case killed 2500 staphylococci per c.cm.

Expt. 23.9.30. A. E. W.'s blood.—50 c.mm. volumes were filled into capillary tubes and allowed to clot. They were then centrifuged and the sera pipetted off. The volumes of sera were then inoculated with Tuberculin B.E. and then implanted in each case with 58 staphylococci and replaced on the clots. The containing tubes were then sloped so as to form a small angle with the horizontal and were incubated in that position. The number of colonies which developed in the sera were then enumerated. (Table XVI.).

TABLE XVI.

—		No. of colonies which developed.
Control serum	(a) (b)	52 52 } 52
Serum containing—		
$\frac{\text{B.E.}}{\text{2400 million}}$		51 47 } 49
$\frac{\text{B.E.}}{\text{1200 million}}$		42 41 } 41½
$\frac{\text{B.E.}}{\text{600 million}}$		47 44 } 45½
$\frac{\text{B.E.}}{\text{300 million}}$		35 37 } 36

Calculation shows that the serum killed 640 staphylococci per c.cm.

Yet another way of arranging the experiment (there is also a fourth, which will be considered elsewhere) is as follows:—

We take a series of capillary tubes upon the stems of which we have marked off two segments of, let us say, 25 c.mm. capacity. We then fill into the distal segments blood from the finger, incubate for 20 to 30 minutes and then expel the clots. Having thus provided ourselves with capillary tubes divided into two segments, of which the distal one is carpeted with leucocytes and the proximal one uncarpeted, we introduce into these combined segments through the proximal ends of the tubes in each case a 50 c.mm. volume of serum—the sera employed for the purpose having been implanted with graduated quanta of staphylococcus. The tubes are now sealed up without displacing the columns of serum, and, the unlined segments being kept uppermost, are sloped so as to form a small angle with the horizontal; they are then placed in the incubator. The protocols of two experiments of this kind are subjoined.

Expt. 2.1.31. R. M. F.'s blood. (Table XVII.)

TABLE XVII.

Dilution of staphylococcus culture implanted into the serum.	No. of microbes suspended in the serum in the		No. of colonies which developed in the serum in the		Percentage of survivors in unlined segment.
	Lined segment	Unlined segment	Lined segment	Unlined segment	
$\frac{\text{Staph.}}{180{,}000}$	12	12	0 0	15 7 } 11	90
$\frac{\text{Staph}}{90{,}000}$	24	24	0 0	7 5 } 6	25
$\frac{\text{Staph.}}{30{,}000}$	72	72	0 0	33 34 } 33½	48
$\frac{\text{Staph.}}{10{,}000}$	216	216	0 0	73 82 } 77	30
$\frac{\text{Staph.}}{3{,}000}$	720	720	0 0	120 120 } 120	17

Here the serum in the unlined segment of the tubes killed in the most favourable case, 24,000 staphylococci per c.cm.

Experiment. A. E. W.'s blood. (Same technique as in the above.) (Table XVIII.)

TABLE XVIII.

Dilution of staphylococcus culture implanted into the serum.	No. of microbes suspended in the serum in the		No. of colonies which developed in the serum in the		Percentage of survivors in unlined segment.
	Lined segment	Unlined segment	Lined segment	Unlined segment	
$\frac{\text{Staph.}}{160{,}000}$	6	6	0 0	0 3 } 1·5	—
$\frac{\text{Staph.}}{80{,}000}$	12	12	0 0	12 9 } 10·5	87
$\frac{\text{Staph.}}{40{,}000}$	24	24	0 0	19 19 } 19	80
$\frac{\text{Staph.}}{20{,}000}$	48	48	0 0	38 34 } 36	75
$\frac{\text{Staph.}}{10{,}000}$	96	96	0 0	50 67 } 58	60
$\frac{\text{Staph.}}{5{,}000}$	192	192	0 0	73 70 } 71½	37

Here the serum in the unlined segment of the tubes killed in the most favourable case, 4800 staphylococci per c.cm.

When we review these experiments we recognise that *the law*—for we may now call it so—*of zero, or all but zero, bactericidal response to minimal microbic implantations, and of progressively greater response to increasing microbic stimulation*, holds not only of implantations into blood, but also of those made into leucocytic suspensions. And we have further seen that precisely similar effects are obtained with sera pipetted off from respectively lightly and heavily implanted bloods, and also with sera imposed upon respectively lightly and heavily vaccinated leucocytes.

The problem as to whether the increasing killing of serophytic microbes witnessed in effectively vaccinated blood is attributable to increased phagocytic response, or to a development of bactericidal powers in the serum, would appear herein to find its answer.

We shall have to consider later whether the increased phagocytic response which is concurrently obtained does or does not in cases where the action of phagocytes is not mechanically barred, contribute its quota to the observed result.

We may now, taking our cue from the experiments set out in Tables XIII. and XVI., dispose of one further general point before entering deeper into the question of phagocytic response in vitro. On studying the protocols in question you will note two outstanding points of difference between these and those previously considered. It will be noted, first, that instead of the vaccine being directly incorporated into the blood it was here merely placed in abutment against the blood clots. And it will be noted further, that the smaller and larger doses of vaccine here brought into application do not here, as they do when incorporated into the blood, produce opposite effects in the form of positive and negative responses. Instead of that we have here with an extensive range of doses (in the one case with doses ranging from 1 in 2000 million to 1 in 25 million, and in the other case with doses ranging from 1 in 2400 million to 1 in 300 million of Tuberculin B.E.) with every dose a positive bactericidal response.

There is not in reality any matter for surprise in this. For consideration will show that when a vaccine is merely superposed upon a clot there will, in the initial stages of the experiment, come into operation upon the leucocytes only such fraction of the total antigen as may diffuse into the clots. And in conformity with this there will, in the stage of the experiment we are considering, come into lethal operation upon the microbes disposed outside the clot, only the bactericidal substances elaborated in response to this first instalment of antigen.

A number of theoretically interesting points connected with this mode of bringing vaccines into application must be reserved for treatment in a separate paper, but it is of practical interest to reflect that the two contrasted methods of applying a vaccine which we have here been considering have their analogues, the one in intravenous administration and the other in subcutaneous application of vaccines. In the case of the first there is in respect to dosage very little margin of latitude. If we inject a little too much we produce an immediate negative phase. Contrariwise, where a vaccine is applied hypodermically the patient may, even in despite of the administration of an excessive dose, reap benefit om it. For the first instalment of antigen absorbed ay achieve the therapeutic aim we have in view, nd our aim once achieved any negative phase hich may thereafter supervene would be quite nnocuous.

INCREASED PHAGOCYTIC RESPONSE IN VITRO.

We may now pass to the consideration of the hagocytic response obtained in vitro.

Perhaps when all things are taken into consideration e most dramatic demonstrations of increased agocytic response obtained in vitro by vaccines e those which are obtained by the ruse of employing our phagocytic mixtures instead of unheated rum, heated serum—i.e., serum which is almost nuded of opsonin. It will suffice here to cite a gle experiment.

Expt. 5.5.30. A. E. W.'s defibrinated blood.—The blood s centrifuged. The serum was then pipetted off and ated for 45° to 60° C. The corpuscles were washed several mes in normal salt solutions. Two volumes of heated serum were then mixed with one volume of washed corpuscles and one volume of a six-fold diluted staphylococcus broth culture, and there was then added to the control phagocytic mixture one wash of physiological salt solution, and to the other mixtures in each case one wash of a dilution of Tuberculin B.E. These mixtures were then, after incubation for 20 minutes, centrifuged and recentrifuged for 45″ in each direction. Phagocytic films were then made from each sample of blood. (Table XIX.)

TABLE XIX.

= Percentage of leucocytes which phagocytose.
= Percentage of leucocytes containing an uncountable number of staph.

—	Phagocytic.		A	B
	Count.	Index		
Heated serum + corp's + $\frac{\text{staph.}}{6}$ + 1 Wash of normal salt	2 3·3 } 2·6	1	42 57	5 5
Heated serum + corp's + $\frac{\text{staph.}}{6}$ + 1 Wash (= 1/100th) of $\frac{\text{B.E.}}{\text{256 million}}$	6	2·3	58	16
" " " $\frac{\text{B.E.}}{\text{128 million}}$	2·6	1	10	8
" " " $\frac{\text{B.E.}}{\text{64 million}}$	7·7	3	67	21
" " " $\frac{\text{B.E.}}{\text{32 million}}$	10	3·9	66	19
" " " $\frac{\text{B.E.}}{\text{16 million}}$	7·1	2·8	60	21
" " " $\frac{\text{B.E.}}{\text{8 million}}$	6·1	2·3	49	21
" " " $\frac{\text{B.E.}}{\text{4 million}}$	12·0	4·6	88	48
" " " $\frac{\text{B.E.}}{\text{2 million}}$	5·6	2·2	56	18

In order to appraise at their proper value the figures set down in the first two columns of the above protocol account has to be taken of the fact that in counting the films any ingest of over 20 staphylococci was entered as an ingest of 20. If it had been possible to count the full number of microbes ingested (the percentage of leucocytes containing uncountable numbers is recorded in column 4 of the protocol) the phagocytic indices would have come out very much higher. The phagocytic counts with the optimum additions of vaccine would certainly have reached astonishing figures—let us say an average of 30 or 40 per cell, and the phagocytic indices would have reached 7·5 or 10.

An experiment like the foregoing furnishes conclusive evidence that leucocytes when treated with vaccines, respond, not only (as seen in previous experiments) by excreting bactericidal substances into the serum, but also by an increased phagocytosis. Similar, but owing to the larger phagocytic intake in the control, quantitatively less striking differences between the vaccinated bloods and the controls are obtained by adding appropriate quanta of vaccines to phagocytic mixtures containing, instead of heated, unheated serum. And analysis of these results by the chiastic method has shown that increased phagocytic response obtained is, in most cases, due to a combination of increased opsonic power developed in the serum and to increased phagocytic avidity in the leucocytes. Not infrequently, however, the opsonic power of the serum is increased, while the phagocytic avidity of the leucocytes is reduced; and again, sometimes the phagocytic avidity of the leucocytes is increased while the opsonic power of the serum remains the same or is reduced.

There is, however, in these respects, very little agreement between one experiment and another, and very little also between the figures which represent the phagocytic index of a blood and its component factors—i.e., the figures which represent (*a*) the opsonic index of the serum, and (*b*) the phagocytic avidity of the leucocytes. This is no doubt due to the fact that the washing, centrifuging, and standing in salt solution to which the leucocytes are exposed in chiastic and opsonic experiments all affect their intake, and it is probably also due to the serum of vaccinated bloods containing, in addition to opsonins, antigens which can evoke immunising response in the leucocytes used for testing. There is at this stage no need, I think, to labour the point that the leucocytes of a phagocytic mixture are responsive elements, and are not, in any sense, the analogues of chemical indicators.

IMPORTANCE OF THE FACTOR OF PHAGOCYTOSIS.

I now pass to consider certain general problems which require to be carefully pondered.

The first of these is the problem—already envisaged above—as to whether enhanced phagocytosis or the development of bactericidal power in the blood-fluids is the more important factor in the immunising response which eventuates in increased killing of serophytic microbes in the blood. In connexion with this arithmetical considerations make clear that inasmuch as the blood normally contains 7½ millions of leucocytes per c.cm. there would, if we implanted 100 microbes per c.cm. (and 100 microbes per c.cm. represents a formidable septicæmic infection) be an army of 75,000 leucocytes available for the phagocyting of each microbe.

The same sort of considerations apply to the opsonic capacity of the normal blood fluids. That opsonic capacity as measured (rightly or wrongly) by the ordinary phagocytic technique[14] easily permits of ingests of 10 to 20 microbes per leucocyte of normal phagocytic avidity—and to a total of 75 and 150 millions of microbes ingested per c.cm.

It will be obvious from these data that the normal blood already possesses a phagocytic capacity far in excess of all conceivable requirements. It follows that the explanation of inadequate phagocytosis of implanted or infecting microbes must be sought in the difficulty of leucocytic access to the implanted microbes. When we meditate upon these things and reflect that chemical access (that is access of dissolved bactericidal substances) to implanted microbes must, in the nature of things, be more easily realisable than leucocytic access, and consider further that such chemical access is, in the case of the circulating blood, secured, it comes home to us convincingly that the development of an even moderate amount of bactericidal power in the serum must count for more in the killing of serophytic microbes than any reinforcement of phagocytosis.

The further questions we have to consider are: (1) the question of immediate (I have before called it "*subitaneous*") immunising response; (2) the question of specific or non-specific immunity (we shall see that specific and non-specific are ambiguous terms); and lastly (3) the question of dosage.

THE IMMEDIATE RESPONSE.

One of the things I had to do in connexion with antityphoid inoculation was to refute with data obtained by measuring the bactericidal power of inoculated men before and after inoculation, the traditional belief that ten days must go over before the effect of a vaccination process becomes manifest. I showed there that the effect of inoculation upon the blood was already plainly manifest 24 hours after the administration of the vaccine. A further scaling down of the time deemed requisite for the manifestation of the effects of inoculation was achieved when it emerged from our measurements of the opsonic index that the effects of subcutaneous inoculation and after auto-inoculation were already well developed within an hour after the application of the ictus immunisatorius. And further research has shown that immunising response to vaccines is, in the case of intravenous inoculations, well developed within 10 minutes after the inoculation, and finally, both bactericidal and phagocytic experiments on the blood in vitro—which, of course, lend themselves better to accurate timing—have shown that there is instantaneous response to the introduction of vaccines into the blood. You will, when we come to consider the question of dosage, see that the time requisite for the development of maximum immunising response is not a simple function of the quantum of antigen incorporated, but is largely determined by the soluble or insoluble nature of the antigen and the lytic forces which the blood brings to bear upon it.

(*To be concluded.*)

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[14] It will be shown elsewhere that quite different results are obtained when we employ (and the centrifugalisation method makes this possible) plasma instead of serum in our opsonic measurements.

SAVERNAKE HOSPITAL CONTRIBUTORY SCHEME.—Of this hospital's income of £10,471 last year, £4122 was raised by the contributory scheme—£1000 more than its total income ten years ago. The scheme has 4186 branch secretaries and collectors.

INJECTION TREATMENT OF VARICOSE VEINS AND ITS BEARING ON THE PROBLEMS OF THROMBOSIS.*

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THE injection treatment has within a short space of time so altered our previous ideas on the treatment of varicose veins that it may without exaggeratio be described as revolutionary. There are fashions in medicine as in all things, but injection treatment has by now been widely tested, and the results have been found satisfactory by so many observers th its position in therapeutics may be regarded established. The mode of action of the vario solutions used therefore has an immediate practical interest. But there is an aspect other than th therapeutic, and that is: what effect, if any, has th new method of treatment had on our outlook on th problems of spontaneous thrombosis?

The subject may be conveniently considered unde three headings: (*a*) The pathological changes resultin from injections and their explanation. (*b*) Th relation between thrombosis produced by injectio and spontaneous thrombosis. (*c*) The possible com plications of injection treatment.

Pathological Changes after Injection.

In man the opportunity does not often occur making a series of histological observations at regu intervals after injection, so that these changes most conveniently studied in animals. The margi ear-vein of the rabbit has been most often used this purpose, since it is a comparatively large v lending itself to continuous observation after injection. But, while most of the recorded exp ments deal with the changes at long intervals a the injections (Binet and Verne, Kern and Angle), is the earlier changes that are important in determini the cause of the venous obliteration, and it is chie with these that this paper will deal.

In the first series of experiments, the margi ear-veins of a number of animals were injected wi 1 c.cm. of a 30 per cent. solution of sodium salicylate. The animals were killed at regular intervals and specimens thus obtained showing the microscopical appearances $\frac{1}{4}$ hour and $\frac{1}{2}$ hour after injection, then at half-hourly intervals up to six hours, then at hourly intervals up to 12 hours, and finally at 24 hours. The immediate naked-eye effect of the injections was a general dilatation of the vessels of the ear, which as a result showed a diffuse pinkish blush. By 15 minutes as a rule the circulation in the injected vein had ceased, owing to intravascular coagulation. After some hours, and especially at 24 hours, the whole ear had become swollen and œdematous. Microscopically, the earliest change to be seen in the vein wall was a slight wrinkling and deposit of blood-pigments in the endothelial cells lining the vein (Fig. 1), while the vein valves also seemed liable to early damage (Fig. 2). But in some of these early specimens, in spite of the presence of intravascular clotting, a considerable amount of normal, apparently intact, endothelial lining could be seen (Fig. 1). Later, the endothelium tended to degenerate and disappear, the vein wall stained poorly, and occasionally became fragmented (Fig. 3), and by 24 hours the thin vein wall was almost completely destroyed. For the first few hours after injection the tissues surrounding the veins showed no change, but later a progressively increasing infiltration with polymorphonuclear leucocytes could be seen (Fig. 4).

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* Based on a Hunterian lecture delivered before the Royal College of Surgeons of England on Jan. 26th, 1931.

The histological changes following the intravenous injection of 30 per cent. sodium salicylate in the rabbit thus fall roughly into three stages: (1) intravascular coagulation; (2) destructive changes in the vein wall; (3) acute inflammatory changes in the surrounding tissues.

The significance of these histological changes will be discussed later, but it may be said that in these animal experiments intravascular clotting occurs when the vein wall is little altered, and before the histological signs of acute inflammation have developed.

In the next series of experiments, some of the other solutions commonly used in the treatment of varicose veins were tested in a similar manner to the salicylate, particularly sodium morrhuate, quinine and urethane, and glucose. Animals injected with c.cm. of a 5 per cent. solution of sodium morrhuate showed changes in general similar to those following salicylate injection—i.e., a general dilatation of the vessels of the ear, the rapid formation of an intravenous clot, and subsequent œdema of the ear; and microscopically, degenerative changes in the vein wall (Fig. 5), and an acute inflammatory reaction the surrounding tissues (Fig. 6). Five per cent. sodium morrhuate differed from the 30 per cent. salicylate in that it was not such a certain thrombotic agent. The solution of quinine and urethane used was one containing 13 per cent. of quinine and 6½ per cent. urethane, the usual strength employed clinically. The difficulty in testing this solution was that in the rabbit the margin between a thrombotic dose and a lethal dose is small. But in the positive cases the changes produced in the ear were similar to those following injection of sodium salicylate and sodium morrhuate. The histological findings thus suggest that the general mechanism by which thrombosis produced by these three solutions is similar.

The other solution tested was glucose. A 60 per cent. solution, the strength used clinically, had no effect when injected into the marginal ear-vein of rabbits. A solution was therefore made up twice this strength, the result being a thick syrupy fluid that only passed through a hypodermic needle with difficulty. Even with a solution of this strength thrombosis rarely resulted, though there was often marked œdema of the ear. While conclusions derived from animal experiment do not necessarily apply to man, in the type of experiment here described glucose is certainly a much less efficient thrombosing agent than the other solutions.

MODE OF ACTION.

The next point for consideration is the means by which these solutions produce intravascular coagulation. The first thing to exclude experimentally was a purely traumatic effect from the introduction of the needle into the vein. This was done by injecting a series of control animals with dilute solutions of sodium salicylate and other substances under conditions similar to those of the main experiments, when it was found that any traumatic coagulum was strictly localised to the site of puncture. A simple traumatic effect having been excluded, there are four possible explanations of the thrombotic action of the solutions: (1) that they have a direct coagulating action on the blood; (2) that the coagulation results from the inflammatory reaction set up; (3) that it results from a physical action of the solutions on the vein wall; and (4) that it results from a chemical action on the vein wall.

(1) It was pointed out by Sicard, when he first began to use the method of intravenous injections for varicose veins, that the solutions he used had no direct coagulating action on the blood, and it is easy to carry out a simple series of experiments in a test-tube to confirm this.

Thus 30 per cent. sodium salicylate and freshly drawn rabbit's blood were mixed in a test-tube, and the rate of coagulation at room temperature compared with a similar mixture of normal saline and blood. With one part of sodium salicylate to one of blood, slow hæmolysis took place which was complete in about 12 minutes. When the concentration was reduced to one part sodium salicylate to two of blood, the mixture was still fluid at the end of 30 minutes, when a little hæmolysis was beginning to occur, though the control saline and blood mixture had completely clotted in 12 minutes.

The direct action of sodium salicylate is therefore that of an anticoagulant rather than a coagulant, and it is also a slow hæmolytic agent.

Similar experiments were performed with quinine and urethane and blood, again using saline as a control.

In order to dissolve the quinine and urethane, which tends to crystallise out at room temperature, it is necessary to warm it, so the saline was also warmed in the same water-bath. Heat accelerates the clotting process, and the control tube had firmly clotted in three minutes. Quinine and urethane and blood, on the other hand, mixed in equal parts, was still quite fluid and apparently unchanged at the end of half an hour, when the experiment was abandoned. A similar result was obtained with one part of quinine and urethane to two of blood.

Sodium morrhuate also has no direct coagulating action in vitro, but is a powerful hæmolytic agent, the addition of 1 c.cm. of a 5 per cent. solution to 1 c.cm. of blood resulting in almost immediate and complete hæmolysis. In all these solutions, therefore, a direct coagulating action on the blood can be excluded as the cause of the intravenous thrombosis.

(2) As for the second possible explanation, the clot has usually formed some time before the histological signs of acute inflammation appear; and, on the other hand, in some of the animals a well-marked inflammatory reaction was present without thrombosis. The actual inflammatory reaction can therefore be excluded as the cause of the thrombosis, though it probably plays an important part in securing the adhesion and rapid organisation of the clot.

(3) The theoretical objection to the third possibility—that the clotting depends on some physical phenomenon such as osmosis—is the fact that the solution is in gross contact with the vein wall for such a short time. But more positive evidence against osmosis is afforded by the fact that, in the experiments mentioned above, very strong solutions of glucose, which would have a high osmotic pressure, proved such unreliable thrombotic agents. Though osmosis might play a part under conditions of marked stasis, in the average case it is probably not the important factor.

(4) We are thus left with the explanation that the thrombosis is due to the chemical action of the injected fluids on the vein wall; a chemical process would more easily than a physical explain the damage to the vein wall resulting from the momentary contact of the solution. As a result of this damage, tissue juice is presumably liberated, which combines with the fibrinogen of the blood. While the general mode of action of the solutions is the same, it does not necessarily follow that the precise chemical changes are the same in all, but of this we have no knowledge.

FIGS. 1 2 3 4

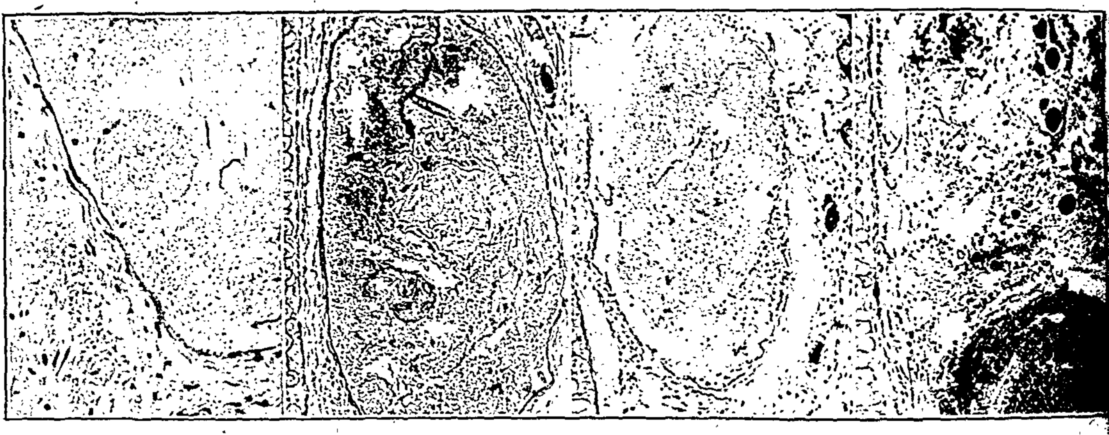

FIG. 1.—High-power view of wall of ear-vein half an hour after the injection of 30 per cent. sodium salicylate, showing in places apparently intact endothelium. (× 235.)

FIG. 2.—Low-power view of same vein as in Fig 1, showing intravascular clot and remains of valve with fibrin network springing from it. The surrounding tissues are unchanged. (× 60.)

FIG. 3.—Low-power view of ear-vein nine hours after the intravenous injection of 30 per cent. sodium salicylate, showing destructive changes in the vein wall and polymorphonuclear leucocytosis in the surrounding tissues. (× 60.)

FIG. 4.—Ear-vein 24 hours after the intravenous injection of 30 per cent. sodium salicylate, showing almost complete destruction of vein wall and intense polymorphonuclear leucocytosis in the surrounding tissues. (× 60.)

Generally speaking, the sequence of events after the injection of varicose veins in man seems similar to that in animals. As a rule, no pain is felt at the time of the injection, though sodium salicylate sometimes provides an exception to this rule. The precise time of occurrence of thrombosis in man is difficult to determine. As judged by the history, it seems to be present in many cases within eight hours or so of the injection. In most cases, a varying amount of discomfort, due to inflammation in and around the vein wall, is complained of some hours after the injection, which is usually worse the next day. There has been no opportunity in this inquiry to make histological observations on the early changes in man, but Hanschell has described a case in which portions of the vein were excised and microscoped 15 minutes, 24 hours, and seven days after the injection. In 15 minutes there was no change in the wall of the vein or its lumen; at 24 hours the vein was filled with clot, there were destructive chan in the intima, and small round-celled infiltration the tissues around the vein, while at seven days clot was undergoing organisation. So that clinically and pathologically the sequence of ev after injections into varicose veins in man wo appear to be generally similar to those already no in the experimental injections.

There is, however, one important difference bet the animal experiments and the thrombosis ind clinically in the treatment of varicose veins, and is the relatively large doses required in the ani experiments. The doses that have had to be gi to produce thrombosis, in spite of the fact that rabbit's vein is so much smaller and thinner, very similar to those employed clinically, and we solutions, such as 15 per cent. sodium salicyl usually have no effect. The explanation of difference probably lies in the rate of blood-flow.

FIGS. 5 6 7 8

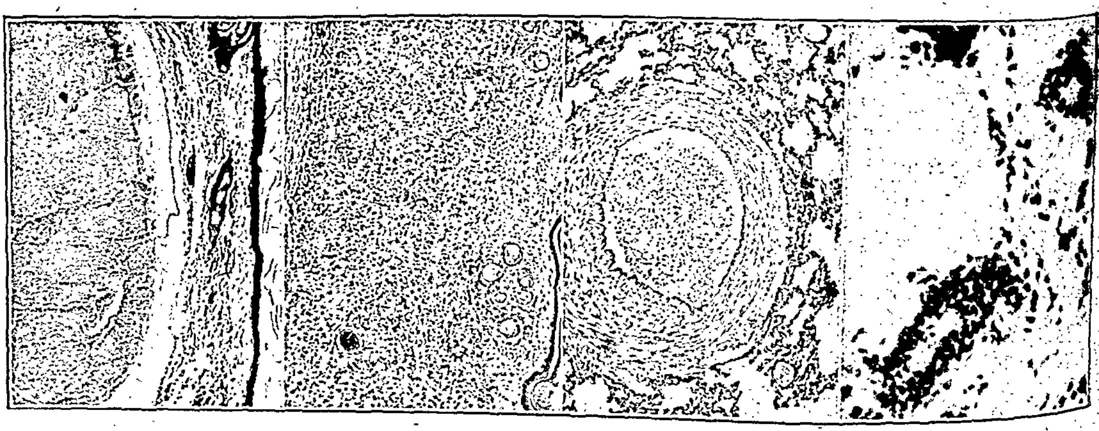

FIG. 5.—Ear-vein 48 hours after the intravenous injection of 5 per cent. sodium morrhuate, showing similar destructive and inflammatory changes. (× 50.)

FIG. 6.—To show the intense leucocytosis in the surrounding tissues 48 hours after the intravenous injection of 5 per cent. sodium morrhuate. (× 50.)

FIG. 7.—Lung artery of rabbit filled with hæmolytic debris and leucocytes after fatal dose of sodium morrhuate. (× 50.)

FIG. 8.—Lung capillaries choked with leucocytes after fatal dose of sodium oleate. (× 300.)

varicose veins we are dealing with a comparatively stagnant column of blood out of the main stream of venous return, whereas in the marginal ear-vein of the rabbit we are dealing with the main venous drainage of an organ with a free and active blood-supply. The practical significance of this difference is that it is probably this same factor—the rate of blood-flow—that in man protects the deep veins from thrombosis when varicose veins are injected, especially in the cases that are occasionally met of widespread superficial thrombosis following a single injection.

Relation between Thrombosis Produced by Injections and Spontaneous Thrombosis.

For comparison with the artificially produced thrombosis three typical and common forms of spontaneous thrombosis may be taken: (1) idiopathic thrombophlebitis arising in varicose and other superficial veins; femoral thrombosis such as is met with after operation; and (3) massive pulmonary embolism.

Thrombophlebitis, spontaneously arising in varicose and other superficial veins, and chemically produced thrombosis clinically indistinguishable. In both there hard tender lump with obvious inflammatory signs around, in both the contained clot is a typical thrombus. The presumption, therefore, is their pathology is similar, and that the spontaneous thrombus is due to some agent acting on the wall of vein. In some cases agent may be something obvious, such as septic process; in others it may be something obscure.

The thrombosis associated with massive pulmonary embolism, on the other hand, presents many differences. Local changes in and around the vein are little marked that in a large number of cases the source of the embolus cannot be found even at post-mortem, while the structure of such a thrombus shows typical architectural arrangement of platelet, leucocyte, and red clot.

A localised femoral thrombosis presents features intermediate between idiopathic thrombophlebitis and pulmonary embolism. Signs of inflammation in and around the vein wall are present, as in the former, but the clot has the same naked-eye and microscopical characteristics as the pulmonary embolus clot.

There are thus three gradations: a spontaneous thrombophlebitis that appears identical pathologically with the chemically produced thrombus, localised femoral thrombosis representing an intermediate stage, and, finally, the thrombosis associated with pulmonary embolism. The difficult thing to determine is whether these three gradations represent different pathological processes, or similar pathological processes of different degrees.

FIGS. 9 10 11

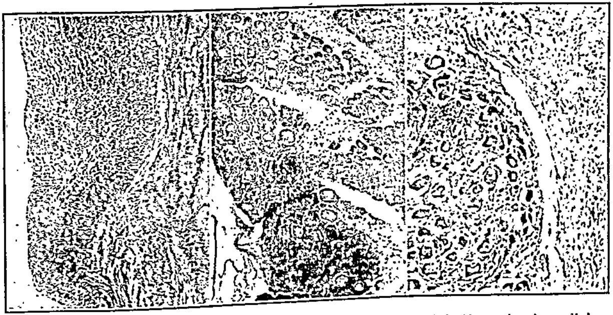

FIG. 9.—Lining of human varicose vein that failed to respond to injections, showing cellular fibrous tissue on fibrosed muscle. (× 35.)

FIG. 10.—Muscle of rabbit 24 hours after injection of sodium morrhuate, showing, from left to right, necrotic muscle remnants, dense aggregations of polymorphonuclear leucocytes, and normal muscle bundles separated by œdema and leucocytes. (× 50.)

FIG. 11.—Muscle of rabbit 21 days after injection of 30 per cent. sodium salicylate, showing dense cellular fibrous tissue intersecting muscle. (× 50.)

The causes of thrombosis are usually classified under three headings: (1) changes in the vessel wall; (2) changes in the blood flow; and (3) changes in the blood itself. Various changes in the blood have been described after operations and other conditions predisposing to thrombosis, such as changes in the coagulation time (Allen), the sedimentation time (Heusser), the leucocyte count (Dawson), and more recently the platelet count (Dawbarn, Earlam, and Evans). But no conclusive experimental proof has yet been brought forward that these changes are directly related to thrombosis. On the other hand, by a combination of the first two factors—stasis and an alteration of the vessel wall—thrombosis can be induced with ease, both clinically in the treatment of varicose veins and experimentally. The injection treatment of varicose veins thus introduces no new principle, but its pathological importance is that it concentrates attention anew on these two factors—stasis and changes in the vessel wall—to the relative overshadowing of changes in the blood.

The Possible Complications of Injection Treatment.

These may be conveniently considered under the following headings: (1) Pulmonary embolism. (2) General symptoms. (3) Failure of a vein to respond to injections. (4) Injection ulcers.

(1) *Pulmonary embolism.*—The theoretical danger of pulmonary embolism was the first and most obvious objection to the injection treatment of varicose veins. Time and experience have proved that it is an excessively rare complication of injection treatment, and the reasons for this are probably twofold. In the first place, varicose veins are a very rare source of emboli at any time. Thus, out of 24 consecutive cases in the post-mortem room of the Middlesex Hospital of pulmonary embolism in which the source of the embolus could be traced, in none was it a varicose vein; and other similar figures could be given. In other words, the stagnant condition in varicose veins that favours thrombosis renders embolism unlikely. The second reason can be found in the histology of injected veins. The thrombus itself after injections is an ordinary red thrombus similar

to other rapidly formed thrombi, but in and around the vein wall there is an inflammatory reaction that probably favours the early adhesion and organisation of the contained thrombus.

(2) *General symptoms.*—Patients after injections for varicose veins are not as a rule upset, and are able to continue their normal occupations; only rarely are the general symptoms severe. In man, therefore, the margin between a therapeutic and a toxic dose is a wide one. It was thought, nevertheless, that a study of the toxic effects of these solutions in animals would be of some interest in indicating the type of reaction that might follow excessive doses in man.

It has been seen that rabbits tolerated comparatively large doses of a strong solution of sodium salicylate. This is in accordance with clinical experience, which is that sodium salicylate is the solution that can be used in the highest concentration and dosage. In some of the animals, however, that received 2 c.cm. of a 30 per cent. solution intravenously, a bright red condition of the whole of both lungs was found, which was seen microscopically to be due to diffuse hæmorrhage and œdema of the lungs, presumably the result of damage to the endothelium of the lung capillaries.

It has been noted already that in vitro sodium morrhuate is a powerful hæmolytic agent, and when it is injected in large doses intravenously in animals a similar hæmolysis may take place in the circulation. This may be shown by the passage of hæmolysed blood in the urine, but more frequently sudden death results, owing to the blockage of the lung arterioles and capillaries with hæmolytic debris and leucocytes. Fig. 7 shows a lung artery from such a case. A similar blockage of the lung capillaries with hæmolytic debris and leucocytes is produced by other unsaturated fatty acids besides sodium morrhuate. The most striking appearances were seen with sodium oleate, which is not used in the treatment of varicose veins but was tested on account of its chemical and physical relationship to sodium morrhuate. Fig. 8 is a microphotograph of the lungs of a rabbit that died after the intravenous injection of 1 c.cm. of a 5 per cent. sodium oleate, showing the lung capillaries choked with leucocytes and debris. The leucocytes are much more marked than in the case of sodium morrhuate, and this may be due to the more marked irritant action of sodium oleate on the endothelium of the lung capillaries, whereby the leucocytes adhere more readily.

Quinine and urethane was the most toxic of the three solutions, 1 c.cm. as a rule killing a 2 kilo rabbit in a few seconds. Microscopically, no definite change can be detected in the lungs, and presumably the action is directly on the heart or central nervous system. These findings can be correlated with the fact that clinically, according to some authors, quinine solutions are the most likely to be associated with idiosyncrasy—i.e., an excessive general reaction from an ordinary therapeutic dose.

It should be emphasised that these toxic effects in animals are obtained with doses that, taking into account the weights of the animals as compared to man, are many times in excess of the ordinary clinical therapeutic dose.

(3) *Failure to respond.*—Fig. 9 is a microphotograph of the varicose vein of a patient who had had injections at weekly intervals for several months without success, so that eventually it was excised. Microscopical examination showed a thickened vein, the inner coat of which was composed of a thick mass of young cellular fibrous tissue, which presumably indicates an inflammatory reaction from the injections. There is clinical evidence to suggest that if for any reason the first few injections fail to act, a conditio of the vein refractory to thrombosis is produced, and it may be that some such anatomical alteration of the vein-lining as is shown by this case may be th cause.

(4) *Injection ulcers.*—This is usually an indication that the solution has been injected into or has leaked into the tissues around the vein. Occasionally, however, it occurs when the solution has been properly injected into the vein, from sloughing of the whole vein wall with the surrounding skin. These ulcers are painful and chronic, and often constitute a much greater nuisance to the patient than the original varicose veins. No solution is exempt from liability.

In animals, the effect of interstitial injection depends on the site injected. Thus, a few minims any of the solutions injected into the tense tissues the rabbit's ear causes inflammation with ulceratio and often sloughing of the whole thickness of th ear. On the other hand, the injection of 1 or 2 c.cm under the loose skin of the thigh sometimes causes similar inflammatory reaction with ulceration, sometimes has no gross effect. The ulceration d not depend on the solution used, since it occurs after the injection of each kind.

After intramuscular injections also, the effect all three solutions—sodium salicylate, sodium mor huate, and quinine and urethane—is essentially t same. Sometimes there was merely an inflammato œdema that gradually subsided, but more often th was an early stage of necrosis and acute inflammati and a late stage of fibrosis. Fig. 10 illustrates appearances in the early stages after injection. the centre is necrosed muscle surrounded by a d mass of acute inflammatory cells, while further the muscle bundles are being separated by œd and loosely arranged inflammatory cells. In late stage of fibrosis (Fig. 11) there was ma fibroblastic proliferation in which the cells of muscle sheaths appeared to be participating. may be presumed that injection ulcers of man sh similar changes.

In conclusion, injection treatment of vari veins has proved a valuable therapeutic mea but the object of this paper is to show that subject is worthy of study not only from this asp but also as a large-scale experiment in the pro tion of thrombosis and aseptic inflammation.

Summary.

(1) The injection of some of the solutions commonly used in the treatment of varicose veins into the marginal ear-vein of rabbits is followed by the early formation of an intravenous clot, destructive changes in the vein wall, and an acute inflammatory reaction in the surrounding tissues. The general mode of action of the different solutions is similar. The intravenous clot is formed when the vein wall is little altered and before inflammatory changes have occurred and is probably due to liberation of tissue juice from the chemical action of the solutions on the vein wall.

(2) After the injection of massive doses of these solutions intravenously in animals, death results in various ways, depending on the particular solution. Interstitial injection produces necrosis and an acute inflammatory reaction, often associated with ulceration, and later a dense fibrosis. In this respect the action of all the commonly used solutions is similar.

(3) The sequence of events after the injection of varicose veins in man seems generally comparable with the experimental findings. In addition, all gradations may be met with between thrombosis, indistinguishable clinically and pathologically from

chemical thrombosis, and a condition like pulmonary embolism with apparently quite different features.

I have pleasure in acknowledging my indebtedness to Prof. J. McIntosh for granting me facilities for carrying out these investigations, and for his kind interest.

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A CASE OF ACUTE LYMPHATIC LEUKÆMIA.

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A MAN, aged 44, was admitted to the Mater Miseri- rdiæ Hospital on Nov. 19th, 1930. There was a rpuric rash on the front of the chest, on both fore- ons and on the right shin; on the dorsum of the ght foot there was a subcutaneous ecchymosis hich was evidently, from the colour changes, some ys old. The patient did not feel or look very appeared only slightly anæmic and came simply cause of the purpura, which had first appeared e days before admission. His previous history as unimportant except for typhoid fever in 1911. eneral physical examination revealed nothing normal except one abscess shown by X rays at e root of the upper left second molar tooth. he heart, lungs, abdomen, and urine were normal, he blood pressure 150/80, the pulse-rate 72, the ulse regular, and the spleen and liver were pparently not enlarged. The erythrocyte count was 940,000 and the leucocyte count 8600 per c.mm.; he hæmoglobin was 90 per cent. (Sahli), the colour- ndex 1·15, and the platelet count 100,000 per c.mm. The differential leucocyte count showed (per cent.) 13 small lymphocytes, 26 lymphoblast-like cells, 16 arge lymphocytes, 12 polymorphonuclear neutrophile leucocytes, and 3 large mononuclear cells (see Table). Reticulocytes were 0·8 per cent. and there was less than 0·1 mg. of bilirubin per 100 c.cm. of blood. The blood calcium was 9·4 mg. per cent., the clotting time four minutes, the bleeding time from a prick two and a half minutes, and the clot retraction poor. The Wassermann reaction was negative. A fractional test-meal analysis, done because of flatulence and slight glossitis, after the patient had been about three weeks in hospital, showed achlorhydria.

For the first two weeks of observation, purpura was a prominent feature, crops of purpuric spots appearing in some areas of skin while they were fading in others, and there were occasional subcutaneous extravasations of blood of moderate size; later the purpura became less prominent, and in the last two weeks it showed itself only as odd spots. A few days after admission oozing of blood from the gums became troublesome and remained so throughout, except when it disappeared for four or five days after transfusion of blood. There were occasional hæmorrhages from the gastro-intestinal tract (melæna), occasional attacks of hæmaturia and epistaxis, and submucous hæmorrhagic spots frequently appeared on the buccal mucous membrane and soft palate. Blood culture was negative and at no time was there pharyngitis or stomatitis. On Dec. 14th the patient complained of dimness of vision, and ophthalmoscopic examination showed rather extensive retinal hæmorrhages which were pronounced subhyaloid by Dr. D. O'Donoghue; later, retinal, vitreous, and subconjunctival hæmorrhages occurred.

The abscessed tooth was removed by Dr. Ryan a few days after admission and the resulting steady oozing of blood from the alveolus gave some trouble before it was controlled. In the latter half of the illness the temperature sometimes rose to about 100° or 101° F., for a few consecutive days; as time went on the respiratory rate gradually rose to 38 and the heart-rate to 140, and as the anæmia progressed "hæmic" murmurs became audible over the præcordium. The progress was downward, the patient becoming gradually weaker and more anæmic, with temporary partial improvement for some days after transfusion of blood. The spleen was never palpable and the liver edge was for the first time just felt below the costal margin two days before death.

The patient died 67 days after admission and a partial autopsy was permitted. The results of the chief laboratory examinations are recorded in the Table, and the post-mortem findings are discussed below.

The main treatment consisted of transfusion of whole (uncitrated) blood; five such transfusions were given of 320 to 1000 c.cm. each on Nov. 16th, 23rd, and 24th, and Dec. 6th and 18th. Adrephine and adrenalin were used for local treatment of the gums, and hæmoplatic serum for local treatment and by injection; adrenalin was also administered subcutaneously, by mouth and per rectum, and attention was directed to mouth hygiene. Whipple's new liver extract with iron for secondary anæmia, liver extract for pernicious anæmia and whole liver were, in turn, given by mouth, with no beneficial result. Radiostoleum was given by mouth, calcium was given intravenously and by mouth, and iron and hydrochloric acid were given by mouth. These and other drugs were often ordered in desperation and not necessarily because of any scientific basis for their use. The diagnosis of acute ("aleukæmic") lymphatic leukæmia was made after the first blood count, and, we believe, was verified by the subsequent events. Leucopenia appeared after some weeks and was replaced towards the end by lymphocytosis of considerable degree with almost complete agranulocytosis.

The first total leucocyte count immediately impressed the observer by the size of the white blood corpuscles. On examination of the stained films this feature was again prominent, as was also the immature type of many of the white cells. The cells which at once focused attention in the stained smear were of the large lymphocyte type, but these cells bore characteristics which placed them in a category of priority in hæmatopoietic origin to the mature large lymphocyte of the peripheral blood. Apart from the relatively large size of the cells in question—about 18 microns in diameter—even more striking and undoubtedly more cytologically important was their nuclear structure. The nuclei of these cells showed a coarse basi-chromatin stippling, which at the nuclear edge was collected into a fairly dense nuclear membrane. A varying number of nucleoli were present—2 to 3 per cell. The nuclei measured about 16 microns in diameter and showed a graceful, sinuous but comparatively rounded outline. The cytoplasm showed a clear non-granular rim of varying depth, at the widest about 2 microns in diameter. These characteristics enabled the cells to be classified as lymphoblasts. In contradistinction, the nucleus of the myeloblast presents a fine stippled structure and no nuclear membrane, while the nucleus of the pro-monocyte has a fine thread-like basi-chromatin arrangement; no such cells were seen in this patient's blood.

The oxidase reaction has fallen somewhat into disrepute of recent years, owing to its inability to distinguish between the early myeloblast and the early lymphoblast; however, its application failed to demonstrate any granules in the cells under examination. We are inclined, for various reasons, to lay special stress on the morphological characters of the lymphoblasts; they appeared in the blood at an early stage of the disease, they indicated a grave hæmatopoietic lesion, and they increased in numbers through the illness.

The number of lymphoblasts in the blood was considerable on the first examination, comprising 26 per cent. of the differential leucocyte count. The remainder of the differential count showed 43 per cent. of small lymphocytes, 16 per cent. of large lymphocytes, 3 per cent. of large mononuclears, and 12 per cent. of polymorphonuclear neutrophiles. The total leucocyte count only numbered 8600 per c.mm. In order to avoid a tedious repetition of figures the Table has been constructed to show the various important laboratory findings during life.

Date.	Erythrocytes per c.mm.	Hæmoglobin per cent.	Colour-index.	Leucocytes per c.mm.	Platelets per c.mm.	Anisocytosis.	Poikilocytosis.	Polychromatophilia.	Punctate basophilia.	Normoblasts.	Megaloblasts.	Small lymphocytes.	Large lymphocytes.	Large mononuclears.	Polymorphonuclear neutrophiles.	Eosinophiles.	Basophiles.	Lymphoblasts.	Other findings.
Nov. 20	Mill. 3,940	90	1·15	8,600	100,000	—	—	sl.	—	—	—	43	16	3	12	—	—	26	Clotting time 4 min.; bleeding time 2½ min.; clot retraction not good Calcium, 9·37 mg. per 100 c.cm. serum. Urine: no album'n.
,, 24	—	—	—	—	165,000	+	—	—	—	—	—	—	—	—	—	—	—	—	Stools: occult blood strong positive
Dec. 1	3,280	70	1·07	8,400	145,000	+	—	rare.	—	—	—	27	6	2	13	—	—	52	Tendency of white blood corpuscles break down and form shadow ce Rieder cells present.
,, 4	2,620	60	1·15	8,200	145,000	+	sl.	—	—	—	—	23	11	—	10	1	—	55	Reider cells present.
,, 9	1,680	45	1·36	6,600	125,000	+	sl.	rare.	—	—	1 in 1 film	17	9	—	4	—	—	70	Urine: heavy cloud of albumin; bloo
,, 11	1,900	35	0·92	5,100	150,000	+	sl.	sl.	—	—	1 in 1 film	16	9	—	5	—	—	70	Megalocytic tendency.
,, 15	1,440	35	1·25	5,000	75,000	+	sl.	sl.	—	—	—	28	12	1	12	1	—	46	Urine: trace of albumin. Sto occult blood strong positive.
,, 18	1,340	30	1·15	3,700	90,000	+	sl.	sl.	sl.	—	1 in 1 film	36	14	2	10	—	—	38	Reticulocytes: 0·8 per cent. T meal: achlorhydria.
,, 22	1,010	20	1·00	2,700	80,000	+	sl.	—	sl.	5 in 2 films	1 in 2 films	45	3	1	9	—	—	42	Distinct megalocytic tendency. Re culocytes: 1·2 per cent. van Bergh: less than 0·1 mg. of biliru per 100 c.cm. of plasma. Urine: trace of album'n; a few red blo corpuscles.
,, 23	—	—	—	—	—	+	—	—	—	—	—	—	—	—	—	—	—	—	Blood culture: negative.
,, 29	1,450	34	1·1	2,800	—	+	sl.	sl.	—	—	—	27	5	—	7	1	—	60	Numerous free particles of cytoplasm.
,, 2	1,520	30	1·0	3,000	150,000	+	—	sl.	sl.	—	1 in 1 film	38	5	—	18	—	—	39	—
,, 9	—	—	—	2,000	—	+	sl.	sl.	sl.	—	—	31	6	—	15	1	—	47	Megalocytic tendency.
,, 17	1,125	20	0·9	11,350	29,000	+	sl.	sl.	—	—	—	23	11	2	13	1	—	50	,, ,,
,, 20	—	—	—	23,000	—	sl.	sl.	sl.	sl.	1 in 1 film	1 in 1 film	8	3	—	3	—	—	86	—
,, 24	—	—	—	31,000	—	sl.	sl.	sl.	—	—	—	8	4	—	1	—	—	87	A few Rieder cells; numerous free particles of cell cytoplasm.

Mill. = millions. sl. = slight or few. + = marked.

Through the whole series of observations there was a rapidly progressive anæmia which very soon assumed a "pernicious" type. There was no leucocytosis until near the end; indeed, although there was soon a leucopenia, it must be noted that the fall in leucocytic numbers ran almost parallel on its own level with the decreasing numbers of red blood corpuscles, until in the later examinations a leucocytosis became manifest. The relative lymphocytosis might, at first sight, be taken to be the result of a compensatory over-activity of a normal lymphocytic system. The lymphocytic system showed, however, grave departure from the normal, as evidenced by the occurrence, persistence, and increase of *immature elements—namely, the lymphoblastic* cells. It would seem as if the disease of the lymphocytic system was the basic lesion and that the myeloid disturbance, as evidenced by the decrease of granulocytes and blood platelets, and the megaloblastic anæmia, were secondary. The disease was, therefore, *considered to be a leucosis of the acute lymphatic* type, but exhibiting unusual characters. It was now considered necessary to correlate our findings with the known atypical leukæmias. To quote from Piney[1]:

> "It has long been recognised (Cohnheim) that all the anatomical changes characteristic of 'leukæmia' might occur without any increase in the number of circulating leucocytes, although there were grave alterations in the qualitative composition, as evidenced by the presence of immature cells of a character not found in the normal circulation; this is the 'pseudo-leukæmia' of Cohnheim and the 'aleukæmic leukæmia' of many authors. The essential changes in the hæmatopoietic tissue in these diseases are great cellular overgrowths together with alteration in the structure of the newly formed cells."

Reed,[2] in 1902, described a case of acute lymphatic leukæmia without enlargement of lymphatic glands.

In our case, in the early stages, the colour-index of 1·15 may, we think, fairly be taken as at an extreme maximal normal point. On one occasion (Dec. 9th) it rose to 1·36, but in two days' time it returned to 0·92; on Dec. 15th it rose to 1·25, but in three days' time it fell to 1·15, to reach unity four days later.

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[1] Piney, A.: Recent Advances in Hæmatology, London, 1931.
[2] Reed, D. M.: Amer. Jour. Med. Sci., 1902, cxxiv., 653.

It is here interesting to cite a case of "aleukæmic" leukæmia reported by Brodribb and Lazarus-Barlow[3] with an erythrocyte count of 2,200,000 per c.cm., a total leucocyte count of 6600 per c.mm., and a colour-index of 1·4.

Divergent views exist as to the significance of megaloblasts in the peripheral blood. Naegeli and his followers contend that their presence is pathognomonic of pernicious anæmia. Their occurrence in other conditions has, however, been noted by various authorities. Piney[1] states that Ullman and Weiss recorded a case which in its early stages had all the characters of pernicious anæmia, but later became onverted into an equally typical case of acute eukæmic lymphadenosis.

Achlorhydria does not appear to have been recorded n the study of previous published cases of acute mphatic leukæmia.

The blood films showed an abnormal frangibility f the lymphoblastic cells, characterised by the esence of numerous so-called basket, shadow, or mudged cells; there were also present numerous ieder cells or binucleate lymphoblasts.

POST-MORTEM EXAMINATION.

Only a partial examination was permitted, and this was rformed on Jan. 25th, about three hours after death. Atten- n was directed to what were considered the most important gans. The abdomen was opened, and it was noted that e liver was slightly enlarged, pale in colour, firm in nsistency, with sharp edges, and that it bled freely on ision; the whole liver was not removed but a small slice s taken for examination. No enlarged lymphatic glands re felt on palpation in the abdominal cavity. The spleen s removed entire and was slightly enlarged, weighing g. The substance of the spleen was moderately soft, wing bright red points on a pinkish background. The kidney was removed, was of about normal size and was bedded in a large quantity of perirenal fat of a dead ite colour. It was smooth, showed slight persistence of al lobulations and was of a uniformly pale colour.

The thoracic cavity was not opened. The only palpable perficial gland, a small oval one about the size of a haricot an, was removed from the left inguinal region. The head the tibia was trephined and an attempt was made to tain a sample of the bone-marrow; this marrow was mpletely fluid, of a pale colour, showing a few red streaks, d was of about the consistency of cream. Even scraping th a Volkmann's spoon produced only a greasy fluid which mediately spread out, forming a scum, on the surface the fixing fluid. A portion of a rib was excised; marrow appeared normal to the naked eye. Smears were ade from the splenic pulp and from the tibial and rib arrow.

EXAMINATION OF FILM PREPARATIONS OF ORGANS.

Bone-marrow of tibia: Films stained with the greatest fficulty owing to their greasy nature. After treatment ith ether and alcohol, only a few scattered patches with llular content could be made out. These areas consisted artly of normal and megalocytic red blood corpuscles one megaloblast was seen), and partly of cells closely resembling the lymphoblastic cells found in the peripheral blood; nly one myelocyte was noted and no polymorphonuclear ells.

Bone-marrow of rib: The cells closely resembled lymphoblasts. No polymorphonuclear cells were seen.

Spleen smears: Besides showing a number of red blood corpuscles and a few large pigment-containing cells, the bulk of the cells seen were of lymphoblastic type.

In all the film preparations, other than those of the blood, the cells were almost devoid of cytoplasm, were distorted, stained indifferently, and were unsuitable for careful cytological study.

EXAMINATION OF SECTIONS.

Lymphatic gland: The architecture of the gland was moderately well preserved. The lymph follicles were intact, and, regarded as a whole, there was no germinal-centre proliferation. The sinuses and the pulp of the gland contained a greater number than normal of large cells of lymphocyte type. The impression conveyed was that the gland, acting, as it were, as a net, had caught up in its meshes numerous lymphoblastic cells.

Spleen: The malpighian corpuscles were in evidence but were not unduly prominent, nor were they increased in size. Their small cells stood out rather clearly in contrast to the larger cells packing the splenic pulp. Careful examination of the cells contained in the trabecular vessels and of those in the pulp showed them to be identical in appearance and of lymphoblastic type.

Kidney: No collections of lymphoblasts were seen in the kidney. A few were, however, present in the renal capillaries.

Bone-marrow of rib: The cells contained in the marrow spaces were almost entirely of the large lymphocyte type.

Liver: The liver cells in general showed a slight fatty infiltration and a considerable deposit of pigment. The most striking features were collections around the portal areas of lymphoblastic cells, and a subcapsular zone of considerable depth containing many of the same cells. These cells in the portal areas and subcapsular zone were identical with the cells contained in the portal vessels, and were morphologically lymphoblasts. Numbers of these lymphoblasts in the portal areas showed mitotic figures. This particular distribution of lymphocytic cells is very characteristic of lymphatic leukæmia (lymphadenosis).

As only a partial post-mortem examination was possible in this case it is useless to speculate as to the site of origin of the over-production of the lymphoblasts, but in this connexion it is interesting to note the mitoses in the periportal cellular collections.

Leishman's and Giemsa's stains were used for the study of the blood films, and hæmatoxylin and eosin for the paraffin sections. The oxydase reaction was done with hydrogen peroxide and benzidine. We are, of course, aware that it is by many observers considered impossible to distinguish between the lymphoblast and the early myeloblast, but we believe that we were dealing with a case of lymphatic leukæmia for the reasons already stated.

CALCIUM THERAPY AND THE TOXÆMIAS OF PREGNANCY.

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Any means at our disposal to reduce maternal mortality must be exploited; and next to septicæmia, eclampsia is the most potent factor in the production of this mortality. A plethora of investigations have been undertaken, particularly on the biochemical aspect of this disease. This has emphasised the importance of calcium.

Calcium, we know, has an intimate relation to nervous sensitivity; this is shown by the increased excitability of nervous tissue on diminishing the calcium content of the solution which permeates it. Since tetany and uræmic twitchings are associated with a hypocalcæmia,[1] the convulsions of eclampsia might be attributed to a similar disturbance of the calcium content of the serum. A number of authorities have found a progressive lowering of the serum calcium in the latter months of pregnancy. Although there are only about 0·5 g. of calcium in the whole maternal blood stream, we know that the fœtus drains off as much as 8 g. for its own uses.[2] However, there is great difficulty in perfecting a correct technique of calcium estimation. One is, therefore, inclined to suggest that some of the results of the above workers are due to errors of technique. Actually, I always estimated the calcium of a normal blood with every batch of abnormal specimens. This showed the necessity of vigorous centrifugalisation and absolute freedom from hæmolysis. The results obtained are otherwise ridiculously low.

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[3] Brodribb, A. W., and Lazarus-Barlow, P.: THE LANCET, 1931, i., 347.

Nevertheless, it is tempting to correlate, if possible, these three groups of phenomena—the convulsions of hypocalcæmia, the fœtal drain of calcium from the mother, and the convulsions of eclampsia.

Minot has produced in dogs a condition very similar to eclampsia.[3] By giving carbon tetrachloride to animals fed on lean meat he has induced convulsions. With the intravenous administration of calcium chloride, the dogs have recovered 30 minutes after the injection.

TRIAL OF CALCIUM.

During the months January to March of this year there were admitted to Queen Charlotte's Hospital two cases of eclampsia, eight of pre-eclampsia, and one of hyperemesis gravidarum. The serum calcium was estimated in all these cases by means of the Kramer and Tisdall method. Estimations were made in duplicate, and the normal value of serum calcium was taken as 9 to 11 mg. per 100 c.cm. of serum. In only one case—an eclampsia—was the serum calcium below 9 mg. The readings were as follows :—

	Per 100 c.cm serum.		Per 100 c.cm. serum.
Eclampsia	8·5 mg.	Pre-eclamptic toxæmia } ..	9·1 mg.
"	11·3 "	" ..	10·1 "
Pre-eclamptic toxæmia } ..	11·69 "	" ..	9·8 "
" ..	9·3 "	" ..	9·8 "
" ..	9·09 "	Hyperemesis gravidarum } ..	9·3 "
" ..	9·5 "		

In the hope of ameliorating the fits in eclampsia, calcium, in the form of calcium gluconate (10 c.cm. of 10 per cent. solution), was administered intravenously in the above two cases. These will be considered in detail.

CASE 1.—Primigravida, aged 27. Systolic blood pressure, 170. Patient drowsy, slight œdema of legs. Urine solid, with albumin. Three fits before admission. Serum calcium, 8·5 mg. One fit two hours after calcium injection. Serum calcium ten hours later, 10·5 mg. Delivery took place 33 hours after admission. The patient was discharged three weeks later. Serum calcium, 9·6 mg.

CASE 2.—Primigravida, aged 25. Slight œdema of legs. Blood pressure, 180. Urine solid, with albumin. Mentally dull. The first fit occurred during the withdrawal of blood for serum calcium estimation, which reading was 11·3 mg. Following the intravenous injection of calcium four fits occurred during the space of 15 hours, within which time the patient had been delivered. The serum calcium at the end of this period was 13·0 mg. There were three more fits, making a total of eight. Twenty-six days after delivery the serum calcium was 10·8 mg. Renal efficiency tests pointed to impaired function of the kidney (blood-urea—53 mg. per 100 c.cm. ; urea concentration, first hour, 0·8 per cent. ; second hour, 0·8 per cent. ; third hour, 0·8 per cent.).

It will be seen that in the first case there was a definite hypocalcæmia, and, notwithstanding the administration of calcium, one fit occurred. In the second case there was a marked hypercalcæmia, and still the fits persisted. The criticism might be made that the convulsions were maintained by the excessive calcium content of the serum. However, it has been shown experimentally in dogs that there are no ill effects until the serum calcium reaches 14 to 15 mg., when the predominating features are dullness, loss of appetite, atonia, and dehydration.

CONCLUSIONS.

(1) In pregnancy toxæmia there is little deviation from the normal value of serum calcium. (2) In eclampsia there may be fairly wide variations ; in the one case there was a slight hypocalcæmia, in the other definite hypercalcæmia (artificially produced). Calcium therapy in eclampsia is disappointing, and it would appear that the fits are not influenced by the calcium content of the serum.

I am indebted to the staff of Queen Charlotte's Hospital for allowing me to utilise their cases.

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CLINICAL AND LABORATORY NOTES

A CASE OF CANCER OF THE BREAST

TREATED WITH RADIUM AND X RAYS.

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THE following case possesses several features of technical interest.

A woman, aged 40, experienced pain in the right breast. A growth, evidently carcinomatous, about the size of a tangerine orange, was found under the nipple, which was retracted but otherwise normal. There was no discharge, nor was the skin involved. One enlarged gland could be felt in the supraclavicular fossa. A complete radiological examination demonstrated small metastases in the thorax. Further investigation disclosed a large tumour occupying the pelvis ; this proved to be a fibroid about the size of a six-months' pregnant uterus. The surgical removal of the breast—a complete Halsted operation—together with a dissection of the glands in the supraclavicular fossa and removal of the fibroid was considered. It was clear, however, that removal of the breast would have no influence on the thoracic metastases. Consequently, removal of the fibroid would benefit the patient but little and finally there was the doubt as to whether the patient would stand the strain of the double major operation.

The final decision was to implant radium needles under the growth in the breast and glands in the supraclavicular fossa ; to follow this up, as soon as possible, by X radiation—using the "saturation" technique for the destruction of the metastases. The large radiation field used in this method would at the same time include the uterine fibroid. Radium needles were inserted under the growth and glands by the surgeon, and the first saturation dose was administered on the tenth day after the insertion of the needles. At this period considerable local reaction was present, the breast being erythematous and painful, and there was slight sloughing of the skin towards the axilla.

Some workers state that radium and X rays should not be mixed ; in other words, X rays should not be used while radium reaction is still apparent. In this case, however, I decided otherwise, so included the breast in the radiation field, which covered the whole thorax. The immediate effect was a rapid clearing up of the sloughing, while certainly no ill-effects were noticeable.

The trunk was divided into two radiation fields, thoracic and abdominal, and the dose brought up to the point inducing slight nausea. The fibroid, of course, was included in the abdominal field. Without any undue disturbance the breast returned to its normal consistence, although the nipple is still slightly contracted. The glands in the supraclavicular fossa are not palpable, and the opacities previously seen in the thorax are no longer apparent, while the fibroid has shrunk to the size of a cricket-ball.

The saturation method is the utilisation of X rays of the medium wave length with light filtration, and has for its object the absorption of a large number of heterogeneous rays. By this method the dose can be administered over a large area without danger or severe constitutional disturbance of the patient—an important point in patients with malignant disease. It is only in this way that we can expect to influence, by direct and indirect means, these malignant cells that have got astray and are distributed throughout the body in unknown positions, eventually forming metastases.

I find the short wave or intensive radiation technique, whether by radium or X rays, not applicable in prophylaxis, for the essential feature of this method is the *local* delivery of a large quantity of *homogeneous* rays, calculated to deliver a certain dose at a pre-arranged depth.

The statistical tables of Portmann, Forssell, and others clearly indicate that the heavy homogeneous radiation should be avoided in prophylactic work. In fact, I think Béclère is probably correct when he states that this technique should be prohibited in these cases.

Pfahler suggested the saturation method some years ago, and with one important modification—namely, the use of a lower scale of wave length—the results without doubt are superior to the heavy radiation method, and to my mind it is the only logical way to radiate with the object of prophylaxis.

A CASE OF IMPENDING VOLKMANN'S ISCHÆMIC CONTRACTURE

TREATED BY INCISION OF THE DEEP FASCIA.

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The treatment of impending Volkmann's ischæmic contracture by free incision of the deep fascia over the antecubital fossa is a well-established procedure. Murphy, in an address which he gave before the American Medical Association in 1914 on the subject of ischæmic contractures,[1] stated that this method of prophylactic treatment should be adopted if removal of bandages and suspension of the arm have failed. Sir Robert Jones[2] referred to the method again in the opening address to the Orthopædic Section of the British Medical Association in 1928. But these and other references[3 4 5 6] to this operation do not give any detailed case reports. Two cases have been recorded in which an open reduction of a supracondylar fracture was performed owing to signs of impending contracture, and I have myself seen another. In the case reported here, incision of the deep fascia only was performed, the fracture remaining unreduced.

A boy, aged 10, was admitted to University College Hospital with a supracondylar fracture of his left humerus, about five hours after the accident. There was a considerable amount of swelling in the region of the elbow-joint; the radial pulse was fairly easily felt, though weaker than that at the opposite wrist. An immediate attempt was made to reduce the fracture. It was not found possible to flex the elbow without obliterating the pulse, and the arm was laid on a pillow in full extension. The next morning, 18 hours after the accident, the pulse was still palpable; a radiogram showed that the deformity had not been corrected. A second attempt, also unsuccessful, was made to manipulate the fragments into position. After this the radial pulse was no longer palpable, but the boy felt no pain in his forearm; repeated observations were made on his finger and wrist movements to make sure that there was no diminution in the activity of the flexor muscles. Forty-eight hours after the accident there was still no pulsation at the wrist, and he began to complain of pain in all his fingers. It was thereupon decided to operate.

A longitudinal incision was made in the middle line over the antecubital fossa, extending two inches up the arm and down the forearm. The subcutaneous tissues were infiltrated with blood; the superficial veins were much engorged. The deep fascia, when incised, split apart about three-quarters of an inch, and the muscles bulged into the gap. The muscle bellies were very pale, but there was no infiltration of blood into them. The wound was left open, and the arm was put on a pillow in a position of nearly full extension.

The next day the radial pulse was still impalpable, and pain and a sensation of pins and needles were still present, but there was a full range of movements of the fingers and wrist muscles. The pulse was first felt 24 hours after the operation, and thereafter gradually became stronger in volume; the sensation of pins and needles gradually diminished, but did not finally disappear until nine days after operation. The wound was sutured five days after the incision. A week later (and a fortnight after the accident) a Kirschner wire was inserted through the olecranon, and traction applied. The deformity was partially, but not wholly, corrected; callus was already visible in the radiogram. Had the wire been inserted at the same time as the incision over the antecubital fossa was made the deformity might have been fully corrected, as the fragment was then still mobile.

The range of movements at the elbow now, nine months after the accident, is: flexion to 90°, extension full. There is no limitation of pronation and supination, and no pain.

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SCURVY FOLLOWING AN ULCER DIET.

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An instance of severe scurvy in a patient under dietetic and alkaline treatment for duodenal ulcer has recently been under my care, and is of considerable interest.

Relatively few cases of this type have been reported. Davidson[1] describes three cases of deficiency disease in patients on an ulcer diet. The disease was characterised by spongy gums, purpura, dental caries, and intramuscular hæmatomata. Mettier, Minot, and Townsend[2] have reported eight cases of scurvy, two of which occurred in patients on special diet. One woman with gastric ulcer developed scurvy after seven years upon a cracker and milk diet. The other was a man who, owing to diarrhœa, was dieted exclusively upon boiled milk, flour, and biscuits. A month later he suffered from acute bronchitis, and this precipitated a mild attack of scurvy, which speedily cleared up when a more liberal diet was allowed. Immermann[3] describes a case of scurvy in a patient with colitis, whose diet had for 11 months been restricted to rice, milk, eggs, white meats, and broth.

A blacksmith, aged 27, was admitted to a general hospital in October, 1930, with a perforated duodenal ulcer which was sutured under spinal anæsthesia. After a rapid recovery, he was discharged about the middle of November, and advised to take a magnesia mixture before, and alkaline powders after, meals, and to adhere to the following diet:—

Breakfast: tea, and bread and milk with egg, or shredded wheat with milk, or Quaker oats with milk and sugar. Lunch: Madeira cake. Dinner: rice pudding, brown or white bread and butter, madeira cake. (Once a week, steamed white fish.) Tea: two boiled eggs, milk, bread and butter, cake, tea. Sometimes custard, or fish, or jelly.

From November, 1930, until his admission to the Withington Hospital at the end of May, 1931, he rigorously confined himself to this diet. In January, 1931, he was away from work two weeks with influenza, and on recovery he developed pains in the shoulders resembling rheumatism. The pains came and went, were not affected by weather, and when tension was placed upon the joints they became so severe that the patient was unable to move for some minutes afterwards. The ribs were very tender, and hurt when the patient breathed, or pressed upon them. In April the pain shifted from the shoulders to the lumbar region. The gums became swollen and dark, and bled when touched. There was complete loss of hair from the arms, legs, and axillæ; and the hair of the head came out in handfuls. The pain then moved into the thighs, and was so intense that the patient could not stand up straight, and had great difficulty in walking.

On May 20th he was admitted to Withington Hospital. He was then desperately ill. The gums were bluish-white in colour, spongy, and swollen, and bled on the slightest touch. There was a purpuric rash across the back of the shoulders. The petechiæ were raised, hard, and varied up to the size of a split pea. Both popliteal spaces were swollen up with intramuscular hæmatomata, the bluish colour spreading half way down the calf muscles. The knees were flexed, and could not be straightened. The patient was scarcely able to stand, and complained of a sense of tightness of the muscles of the thigh. The blood count was as follows:—

Red cells ..	5,200,000	Polymorphs.	60·2 %
White cells ..	4,600	Lymphocytes	28·2 %
Hb	94 %	Large mononucl. ..	9·0 %
Colour-index ..	0·90	Eosinophil.	2·0 %
		Basophil.	0·5 %

Slight anisocytosis was seen. Platelets were scanty.

He was prescribed a diet which included 4 lemons, 8 oz. green vegetables, 8 oz. potatoes daily, and an occasional grape fruit. Within ten days he was feeling perfectly normal and fit, and was able to walk. The only remaining evidences of the disease were slight yellowish staining behind the knees, and numerous small brownish blotches on the back, marking the site of the purpuric rash. He was then recommended to continue on diet rich in green vegetables, but from which the acid lemons and grape fruit were excluded.

For four months this patient had been treated as a case of rheumatism; later he had been diagnosed as a case of arthritis with pyorrhœa, and total extraction of the teeth had been recommended. Finally, he had been considered to be suffering from rheumatism with purpura, a course of salicylate baths and massage being prescribed. In view of the obscurity of the early symptoms, it seems probable that slight undiagnosed cases of this type are not uncommon.

Since Mettier, Minot and Townsend consider that the onset of the disease is often precipitated by a febrile infection, it is interesting to notice that in this case an attack of influenza heralded the onset of the scurvy.

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LIBRARIES AND HOSPITALS.—Hampstead Public Library has arranged to supply the non-infectious wards of the local hospitals with books from its reserve stock.

SOUTHAMPTON FREE EYE HOSPITAL.—The Bishop of Southampton last week dedicated a new out-patients' department of this hospital, which has cost about £5000. The number of patients, the majority of whom are out-patients, rose from under 6000 in 1920 to 8421 in 1930.

BRITISH MEDICAL ASSOCIATION.

ANNUAL MEETING IN EASTBOURNE.

SECTION OF MEDICINE.

AT the third meeting of this Section the chair was taken by Dr. E. BOSDIN LEECH, Vice-President, and a discussion on

Toxic Goitre, its Course and Treatment,

was opened by Prof. F. R. FRASER. He said that the three lines along which conceptions of this disease had been altered in recent years were: (1) the correlation of the morbid anatomy of the thyroid with the clinical conditions; (2) the therapeutic use of iodine; and (3) the development of surgical treatment. The varying symptomatology of the disease could partially, though not wholly, be accounted for by variations in the strength of the stimulus, in the capacity of the thyroid to react, and in the state of the organs of the patient. In the elderly a moderate degree of intoxication would produce auricular fibrillation where in a young girl it would only produce a tachycardia. In the same way the vaso-motor system, digestive and excretory organs, and higher cortical functions were far more profoundly disturbed in the elderly.

Iodine reduced the thyrotoxicosis and—together with rest and other measures—brought the patient to an optimum condition for operation in a time that might be much longer than the ten days stated in the literature. When operation was unnecessary iodine was one of the most valuable methods of treatment available. It modified but could not prevent relapses. In fact, it did not reach the cause of the disease but merely altered its effects.

As a result of previous experience he had come to the conclusion that surgical treatment was indicated for patients with nodular goitres and for those who did not improve rapidly, became chronically ill, relapsed, or could not submit to adequate observation and treatment. In the quinquennium 1926–30 he had had 136 patients surgically and 64 patients medically treated. He had classed the results under four heads: good, poor, bad, and dead. Of the surgical cases 44 were good, 20 poor, 2 bad, and [illegible] dead; of the medical 23 were good, 15 poor, 3 bad, and 23 dead. Even when allowance was made for future improvement, the high proportion of poor results to good results in the surgical group was noticeable. The proportion of poor results increased with the age of the patient and with the duration of the disease. It was not always realised that the longer the thyroid intoxication continued, even if it was mild in degree and interrupted by numerous remissions, the less likely was the patient to be restored to health. In considering prognosis, ætiology must be taken into account. If the causal factor could be removed and the patient brought under early care, there seemed to be a possibility of recovery without operation in mild cases. In ten of the medical cases with good results there had been marked improvement after tonsillectomy; they had all been mild cases associated with attacks of tonsillitis, with an average age of 29 and average duration of two and a half years. The longer the duration the more difficult it was to discover the causal factor. Since the discoverable factors were such as must be experienced by most people in the course of their lives, there must be a constitutional factor as well, and this factor might be inherited and inborn. It could not, however, be recognised in the absence of the disease. In some patients it seemed to be so strong that no other factor was necessary. The stronger the constitutional element the worse the prognosis, even after thyroidectomy. In some of the "poor" results the patients had given histories of nervousness and excitability all their lives, and seemed to have been below the normal standard of physical efficiency before the onset of toxic symptoms.

Analysis of the results showed that surgery was indicated in most cases severe enough to be admitted to the wards of a general hospital. It was safer to operate at the earliest suitable opportunity than to hope for spontaneous recovery. Some method of reducing the amount of functioning thyroid tissue was essential to save life and restore efficiency. X rays and radium required long courses of treatment, and were uncertain in their results, and operation was preferable, to save time and avoid relapse. The surgeon must be one with special experience of this work. For patients still able to work, treatment by X rays and radium could be begun as soon as the diagnosis was made, and should be accompanied by removal of the causal factor and by iodine medication to reduce the intoxication.

Dr. JOHN EASON pointed out that many patients in alarming or strange circumstances showed a thyroid response which fell short of grave disease. The mobilising function of the gland was in control and the storing function in abeyance for the time being; consequently the gland had to overwork, but the formation of an abnormal secretion was not proved. Among exciting causes he had found emotion and worry in 62 per cent. of cases, though many of the patients at first denied worry because very often the trouble was related to sex. In 20 per cent. the disease had followed very soon after infection by tonsillitis or influenza. The clinical features and histo-pathology naturally varied with the ætiology. There was also a factor of predisposition. Certain endemic conditions, toxæmia, and long strains might predispose the gland to over-response. In the child the development of the autonomic system was inadequate for a response comparable to that known in exophthalmic goitre, but the seeds might be sown in childhood, moulding the active, slender type which resembled the frog produced by feeding tadpoles on thyroid. The female was predisposed by her specific endocrines.

The treatment was primarily medical, though the mortality-rate from operation was not really very high in the hands of an experienced surgeon. Indications for the use of iodine were given by the reaction of the morning and evening pulse-rate and respiration to small doses of potassium iodide. If the swing was flattened out the treatment was satisfactory. The effect of a single dose of grs. 4 of potassium iodide would last four or five days. Radium had produced marked improvement or cure in 24 out of 40 cases, and slight improvement in five more. The treatment only took one day in each two months. The results of medical treatment in Edinburgh were much better than those of Prof. Fraser, the mortality for the last three years being 3·9 per cent. They must refer to a much milder form of the disease.

DEEP X RAY THERAPY.

Dr. E. P. POULTON described the results of deep X ray therapy for toxic goitre. It was important to decide in advance on the line of treatment, as serious adhesions might be produced by deep X rays. Of 14 cases over a year in duration, 64·5 per cent. were able to do their former work and 28·5 per cent. were able to do light work. Similar results had been obtained in other cases not directly under his care. He asked, in view of these figures, why operate? The cases formed a representative series except that only two of them had had auricular fibrillation. The basal metabolism and pulse-rate had gradually fallen as the body-weight had gone up. He stressed the attacks of extreme muscular weakness associated with the disease. The test for it was to ask the patient to stand up on a chair, but many patients would relate that they had to pull themselves upstairs by the banisters.

Dr. W. L. WATT pointed out that the figures for deep X ray therapy compared favourably with the very best surgical results obtainable—those of the Mayo Clinic—and had no immediate mortality. Dr. Poulton's cases had all been treated with medium hard rays. Five cases with post-operative recurrence had shown marked improvement. A sarcoma dose of 80 per cent. was given, and its effect was, to all intents and purposes, a bloodless operation. In moderate cases one treatment was sufficient; in severe cases two were required. Milder cases would recover in two or three months; severe cases needed a year. In very grave cases the treatment was spread over five or six weeks. One case brought up in extremis, after influenza, had had five weekly treatments and had recovered completely. Relapses followed surgical treatment in a number of cases, and here a combination of surgery and X rays was of value.

PRE-OPERATIVE MEASURES.

Mr. JOHN MORLEY pleaded for a rational, carefully thought-out plan of campaign by the doctor in charge of the case. The disease could only be cured by subtotal thyroidectomy or X ray or radium treatment. If X ray therapy was to be safe it must show its effects in a reasonably short time. The milder primary cases should have a trial course, rigidly controlled, for three months. If the results were promising the treatment should continue; if not, the more rapid methods of surgery were the treatment of choice. Rather over one-third of the cases he operated on were X ray failures. The surgeon could promise a cure if the case was not seen too late. The operative risk could be reduced to a minimum by preparatory measures, chiefly the administration of iodine. The first iodine remission was usually the best, and should be the time of operation. Patients should not be put on iodine indiscriminately for several months; it should be held in reserve if there was any likelihood of operation. The next most important preparatory measure was digitalis in heroic doses for cases with auricular fibrillation. There must be an adequate period of physical and mental rest before operation. The diet should be rich in carbohydrates. Every surgeon had his own methods, but Mr. Morley preferred local infiltration anæsthesia for anxious cases, preceded by omnopon and scopolamine in carefully regulated dosage. He had found novocaine and adrenalin safe and efficient. Gas and oxygen must always be available in case local anæsthesia did not suffice. Ether and chloroform were dangerous. Nothing short of subtotal thyroidectomy was curative. The great thing was not to postpone operation so long that irreparable damage was done to the heart muscle.

Mr. W. H. C. ROMANIS declared that the term "toxic goitre" should not be applied to nervous patients with goitres and mild degrees of thyroid toxæmia. He required at least some detectable changes in the eyes and heart. A certain shininess of the cornea and some dilatation of the [illegible] were the earliest signs. In the "primary" of the disease was more severe and rapid; the "secondary" type was less severe, and the disease seemed to pick out the cardiac system as its main object of attack. These cases were very common among school-teachers and nurses. Medical treatment was chiefly valuable in preparation for operation. Radium applicators occasionally produced marked improvement, but both radium and X rays were notably uncertain. In the majority of cases operation gave the best, quickest, and most certain end-results, but many mild cases did not require it, and a few were too severe for it. The only cases definitely too bad for surgery were those with mental symptoms and intractable heart failure. Auricular fibrillation was not a contra-indication. Children should not be operated on until all other methods had failed. The operation should be early, and should be preceded by rest and iodine for 10–20 days. Thyroidectomy was the only reasonable operation, and the usual mistake was to remove too little tissue. Small isolated portions left might hypertrophy and cause recurrence. Local anæsthesia should be preceded by sedatives, preferably avertin. The mortality was about 3 per cent., and the great majority were greatly improved in the minimum of time. Patients should be warned that the exophthalmos would improve less than other symptoms, and that they must live an easy life for a few months after operation.

Mr. T. P. **Dunhill** emphasised the tragedy of the disease, and deprecated the tendency to say that operation was "safe" and "curative," which it was not. In the early stages the treatment should be medically controlled, but that did not mean that the best years of a woman's life should be wasted and operation never offered. He pleaded for earlier coöperation between physician and surgeon. X rays were good in some cases; others were not benefited, particularly very severe early cases and complicated cases. It was soon obvious whether the patient was improving. Operation in good time could send workers back to work and mothers back to their families before their organs were damaged and their capacity for work impaired. Operation should be done on cases with complications that could not be cured, provided the practitioner and patient realised the position. Operation was less crude a method than leaving patients to die or to live with ill-health. Children could not always be left safely; they sometimes died under medical treatment.

Colonel **Robert McCarrison** spoke of the malnutritional predisposing factor, and described experimental work on this subject. Hypertrophy and hyperplasia of the thyroid were most easily produced by feeding rabbits on cabbage; the metabolic-rate was not raised until iodine was added. A diet deficient in fat-soluble vitamin A produced a condition of depleted function of the thyroid cells, and the whole gland became flooded with lymphocytes (lymphadenoid goitre). Diet was very important in the treatment of Graves' disease, which was probably more a general disease than one localised to the thyroid. If the patient was going to utilise his carbohydrates, his diet must be balanced in vitamins and mineral salts.

Dr. J. O. **Summerhayes** spoke of the practitioner's difficulty in getting these nervous patients to go to hospital, and asked what was to be done for early cases by the family doctor.

Prof. **Rabinowitz** remarked on the rôle of the sympathetico-adrenal system in the production of this disease. The denervation of the adrenal medulla might play an important part in therapy. Two myasthenic cases had responded remarkably to ephedrine. Useful diagnostic features were the "scoop" nails, the warm, moist, tremulous hand, and the delicate skin—"the skin you love to touch." The nervous goitrous girl had a cold blue hand. Some of the worst cases were due to small nodules behind the sterno-clavicular junction. Bad cases should be treated surgically. Mild cases were best treated by arsenic, quinine, and luminal, and sometimes codeine, but he preferred surgery to radiation.

Dr. **Florence Stoney** suggested that in early and persistent cases the problem was to find what was irritating the gland: a source of focal sepsis, probably, or a fibroid condition of the uterus.

Prof. **Fraser**, in reply, summed up the agreed points: that a great deal of research was still required, particularly on the origin of the disease; that some means must be taken to reduce the amount of functioning gland tissue; that surgery was essential for urgent cases; and that radiation must be tried in the future for ambulant cases. He did not think that the use of iodine was limited to pre-operative cases and urged it in other circumstances.

SECTION OF SURGERY.

On July 23rd Mr. **R. Ogier Ward** opened the discussion on recent advances in

Diagnostic Methods in Renal Affections.

Mr. Ward paid tribute to Prof. von Lichtenberg who was responsible for the introduction of ascending pyelography, the method by which catheters were passed into the ureters from below, enabling opaque media to be introduced into the renal pelvis and calices. Instrumental pyelography needed care and practice, but given those conditions it was a safe and accurate method of examination and gave well-defined pictures. He pointed out that the radiograms obtained were of shadows and not of the actual objects, and the extreme accuracy obtained was the more satisfactory. Prof. von Lichtenberg was not only the inventor of instrumental pyelography but had been responsible for the development of excretion urography to its present high efficiency, thereby making a further and valued advance in the diagnostic method of renal affections. Several substances had been tried, but the most successful appeared to be D.40, now known as Uroselectan B. Mr. Ward showed a large number of radiograms which had been obtained during his own researches with this drug, and demonstrated its great superiority over its predecessors. Uroselectan B., he said, was introduced into the vein from the sealed ampoules in which it was supplied. Care had to be taken not to inject it outside the lumen of the vein, although no serious results from such an accident had been reported. None of his patients had experienced any untoward effects after the injection. Excretion urography could never replace ascending pyelography in the investigation of routine urological cases; it was an adjunct to this investigation, and only rarely did it supply information which could not have been obtained by other means.

One of the interesting results brought about by this new method of investigation was the fresh light shed upon the neuromuscular mechanism of the urinary tract; it would therefore be of assistance in the pathology and treatment of hydronephrosis, which disease was the result of a defect in the mechanism. A pyelogram clearly demonstrated a hydronephrosis; excretion urography sometimes showed the same hydronephrosis but of a considerably larger size. The reason for this discrepancy was that in excretion urography the kidney filled the pelvis at a rate to which it was accustomed, whereas in instrumental pyelography the opaque fluid had been forced through the ureteric catheter much more rapidly and the pelvis had resisted the process. This gave clear proof that the pelvic neuromuscular mechanism was not destroyed, though damaged, and was an encouragement to the surgeon who wished to perform a plastic operation.

The physiology of the pelvis and ureters in a normal subject, although perfectly demonstrated by the excretion of contrast media, required much study. It was easy to recognise obstruction because substances accumulated above it, but in health the drug was quickly swept along in the urine and the calices were not all filled at the same time. For this reason the shadows might be faint ones and were only apparent in first-class radiograms. The radiograms taken immediately after the injection should be studied with particular care, for later an accumulation of gas in the intestine might make interpretation difficult. Much further study was required, but it would not be long before further advances were made by means of serial and slow-motion cinema-radiography. Such processes ought to make clear the dynamics of the urinary tract in health and disease.

Mr. Ward showed radiograms of cases in which excretion urography had been of special value, since it was undesirable or impossible to pass the cystoscope. Such conditions obtained in the presence of urethral stricture, an enlarged prostate, or in severe cystitis. The passage of a ureteric catheter was not always possible or desirable in ureteric kinking, in urinary tuberculosis, and in the pyelitis of pregnancy. A striking example of its value in a case of ectopic kidney was demonstrated. Excretion urography should be regarded first and foremost as a means of studying the urinary tract as a whole, in a manner hitherto impossible. There was no need to claim that it had made standard methods of investigation of the urinary tract unnecessary; to these methods it should not be regarded as a rival but rather as a supremely valuable ally.

Dr. E. J. H. Roth emphasised the position of the radiologist in relationship to the urologist, and said that his importance rested on the fact that together with the pathologist he helped to form a urological unit. The apparatus now available had made a standard technique necessary. A good radiogram should not be a matter for congratulation, but an ordinary occurrence. The radiologist could never be a diagnostician, and a diagnosis founded on radiograms alone would be of little value and probably inaccurate. Mr. Roth described the technique of modern radiography in detail, and emphasised the modifications which were necessary in both ascending and descending pyelography. The shadows cast in descending pyelography were of such a nature as to demand the maximum radiographic contrast. He depicted and described a radiographic table designed for the new department of radiology at St. Peter's Hospital for Stone. It enabled radiograms to be obtained in the erect as well as in the more usual supine positions—a valuable factor in pyelography. The preparation of the patient for X ray examination of the urinary tract was described and its importance accentuated. Radiology offered valuable assistance in the diagnosis of lesions in the urinary tract. The patient might consider his renal pictures as the final word in the diagnosis of his condition; to the clinician, however, they must remain no more than aids to his own observation.

Mr. R. J. Willan showed radiograms obtained in a series of eight cases in which both ascending and descending pyelography had been carried out. In some of the cases a final diagnosis had been made, and the conclusions had been based upon the results of ascending pyelography; in others the descending method had carried weight in the final diagnosis. Descending pyelography was in its infancy, and much work would have to be done before confidence in its use could be assured. He also had no experience of ill-effects from the use of uroselectan, but he had always been very careful to obtain preliminary information about renal function; to this end he used the pheno-sulphonal dye and the salivary-blood-urea test.

Mr. K. Heritage showed a large number of films illustrating the value of descending pyelography in cases of renal tuberculosis. In his opinion the absence of shadow indicated that the patient had been insufficiently prepared, and a subsequent examination should be carried out.

Mr. J. F. Dobson thought that at first sight the pictures obtained might seem disappointing, but this was only if they were regarded as supplanting those obtained in ascending pyelography. The greatest value of this new method of investigation at present lay in connexion with renal tuberculosis, but it would not be long before descending pyelography became a routine accessory measure in all cases.

Mr. John Hunter said that he had noticed a general dilatation of the ureter in tuberculous cases investigated by means of descending pyelography, and asked whether this might be considered a diagnostic sign. He had seen no ill-effects in cases of deficient renal function investigated by the intravenous method.

Dr. E. W. M. H. Phillips reported the value of descending pyelography in a case of hydronephrosis.

Mr. A. H. Burgess made a plea for the adoption of the terms "ascending" and "descending" pyelography to describe the two methods. He pointed out that ascending pyelography was mechanical and not strictly anatomical in its distension of the pelvis and calices, whilst descending pyelography constituted a physiological process. He emphasised the value of negative results.

Dr. R. V. Hudson referred to a case of Dietl's crisis where no shadow had been seen during the examination shortly after the attack had occurred, but later a well-marked condition of hydronephrosis had become apparent.

Mr. C. A. Joll commented on the great degree of accuracy now obtained in modern urological surgery. He thought that the future of descending pyelography was assured, especially as a method of estimating renal function, and in very early cases of hydronephrosis.

REPLY.

Mr. Ward, in reply to questions, thought that the absence of shadow in apparently normal cases was due to rapidly functioning kidneys. He did not entirely accept the term "descending" pyelography, since the intravenous injection of the contrast medium enabled the observer to obtain an idea of the condition of the ureter and the bladder as well as of the kidney.

SECTION OF DISEASES OF CHILDREN.

On July 22nd the section discussed

Jaundice in Childhood.

The opening paper was read by Dr. A. C. Hampson, the President, Dr. H. C. Cameron being in the chair.

After briefly classifying jaundice on the basis of the anatomical lesion present in different types, Dr. Hampson emphasised the fact that age exerts an influence on the susceptibility to liver toxins; the child's liver is more susceptible than that of the adult, though it also shows a greater tendency to repair, and the liver of an infant shows maximal susceptibility.

JAUNDICE IN THE NEW-BORN.

He said that probably all infants at birth showed an excess of bilirubin in the blood. He had found an average concentration of 1 : 75,000, the normal in the adult being 1 : 1,000,000. In a case of "physiological jaundice," if death due to some other cause should occur, post-mortem examination showed staining of cartilage, of cerebro-spinal fluid, and of the nuclei of the brain, parts which are not stained in other forms of jaundice occurring in older patients. After birth there was a considerable amount of hæmolysis and a sharp rise in the amount of bilirubin in the blood up to the third or fourth day, and then a gradual decline. Before birth the fœtus has two possible methods of excretion of bilirubin, through its own liver and alimentary tract, or through the placenta into the mother's circulation. At birth the infant's liver must take on the whole work, and it might be some time before it was able to assume its full functions; this would afford an explanation of the presence of bile salts in the body fluids. Dr. Hampson's observations suggested that hæmolysis leading to "physiological jaundice" might be associated with a difference in acidity between red cells and plasma, such as he and M. Maizels had found in hæmolytic anæmias.

Icterus gravis neonatorum was similar in various respects to benign icterus neonatorum, but was almost invariably fatal if untreated. In this familial disease jaundice might be present at birth or appear within about 24 hours, and would rapidly deepen. The sequence of events was drowsiness, loss of weight, increasing anæmia, often hæmorrhages with bruising and convulsions, and death usually in coma within three weeks. The stools were normal in colour and liver and spleen were not usually enlarged. If in simple jaundice of the new-born there was delayed assumption of hepatic function, then a lesser competency on the part of the liver or an increased hæmolysis in icterus gravis might result in a fatal toxæmia. With a view to decreasing hæmolysis, Dr. Hampson had given human serum intramuscularly, 15 c.cm. daily for three or four days, with the remarkable result that 23 out of 24 cases made complete recoveries. He believed that cases with enlargement of the liver and spleen and pyrexia belonged to another group, and in such cases results had not been as good. He suggested trying mercury inunctions as well as serum in these cases. Jaundice in congenital obliteration of the bile-ducts usually appeared on the second day; meconium was usually passed, followed by pale stools; the liver was large and very hard and the spleen enlarged, and the infant often surprisingly fit till late in the disease; in the terminal stage hæmorrhages usually occurred and sometimes convulsions. Unlike Dr. Parkes Weber, he had found the cerebro-spinal fluid stained in some of these cases. The lesion was undoubtedly progressive, and the speaker favoured the theory that it was due to maternal toxins circulating through the fœtal liver and excreted into the bile-ducts. Though there was no evidence of the existence of syphilis in these cases, he had had results suggesting that mercury inunctions and serum injections might be beneficial also in this form of jaundice.

EPIDEMIC INFECTIVE JAUNDICE (CATARRHAL JAUNDICE).

Catarrhal jaundice occurred usually in epidemics or sporadically, but pandemics had been noted. The virus was so far unknown. One attack appeared to confer lasting immunity, the maximal incidence of infection being between five and ten years in children. The majority of the cases were observed in autumn. It was possible for the disease to occur in association with enlargement of the liver, but no jaundice; the essential lesion was a hepatitis. The duration of the disease was variable, and the liver might remain enlarged for weeks after all jaundice has disappeared. Occasionally cases suddenly took on grave characters and pursued the course of acute necrosis. Cases of catarrhal jaundice must be regarded as infectious, both before the jaundice had appeared and for some while after it had subsided. A running ear appeared to have been the source of infection in some cases. During epidemics the incubation period was usually 21 to 28 days. Dr. Hampson condemned the use of atophan for this condition. Where commencing cholæmia with necrosis of the liver was suspected he suggested the administration of intravenous glucose and insulin, and perhaps calcium gluconate.

Dr. J. C. **SPENCE** pointed out that epidemic jaundice in England was not due to the leptospira-icterohæmorrhagiæ. The infective agent was probably ultra-microscopic, and the usual incubation period perhaps four weeks. He described the development of the disease in a laboratory worker in whom the incubation period appeared to be five weeks. In the epidemics of so-called "camp jaundice," which he had seen in Gallipoli during the war, just as in the epidemic among the civil population in a part of Sweden in 1924–26, there were occasional cases of necrosis of the liver. In a recent small epidemic which he had been able to observe there were 19 cases of ordinary "catarrhal jaundice" and one fatal case of necrosis of the liver. Tests devised to estimate hepatic function in catarrhal jaundice gave variable results; but probably some of the normal results were due to the tests being carried out during the stage of recovery. In his view it was very important not to overtax liver function in this disease, but to feed the patient on easily assimilable carbohydrates. The symptoms of cholæmia should be more widely known, and Dr. Spence described the case of a boy of nine who showed restlessness, "cholæmic" wailing and shrieking, and nervous symptoms, including changes in reflexes and convulsions, characteristic of such cases. The association between jaundice and signs of derangement of the nervous system was of great interest. As Dr. Hampson had said, diplegia and other evidence of lesion of the nervous system might follow severe types of jaundice in the new-born, and the mental depression occurring with jaundice had had such wide recongition that it had even originated the word "melancholia."

LABORATORY TESTS.

Dr. W. W. **PAYNE** described the results of fragility tests for the red blood corpuscles in hypotonic saline, pointing out a very slight tendency to resist laking found in some cases of jaundice in childhood. The test had, of course, its chief use in the diagnosis of acholuric familial jaundice, but it must be remembered that the cells in this disease did not always show increased fragility, and that laking might occur within so-called normal limits. In doubtful cases the test should be repeated several times, and the result of the van den Bergh reaction taken into consideration. In none of his cases did the van den Bergh test yield normal results. As to liver function tests, he held that these gave little help in diagnosis, but might be of much value in the study of a disease; he had employed them in the study of asthma. In this disease, according to the lævulose test and the adrenalin test, liver function was not infrequently deranged.

The pathogenesis of

CONGENITAL ATRESIA OF THE BILE-DUCTS

was discussed by Dr. H. CHODAK GREGORY. She described the case of a premature infant with the symptoms of this disease. It died when about five weeks old; the liver showed no cirrhosis, and had scarcely any periportal bile-ducts, though bile capillaries were present and were gorged with bile and the extra-hepatic bile-ducts were patent. She believed that in this case the obstructive jaundice was due to a developmental failure of these periportal ducts, and suggested that the cirrhosis usually found post mortem might well be the result of the obstruction to the flow of bile. The known facts concerning the complicated development of the biliary system, and the occasional occurrence of other congenital abnormalities with atresia of the bile-ducts, favoured the view that the condition was in all cases a developmental anomaly.

DISCUSSION.

The PRESIDENT commented on the points of resemblance between the terror-stricken looks and screams of the child suffering from cholæmia, and the symptoms of the child with "night terrors." It was this resemblance which had first led him to employ glucose in the treatment of the latter condition, a treatment which certainly produced good results.

Among subsequent speakers, Dr. H. M. M. MACKAY mentioned the occurrence of types of jaundice in infants which it was difficult to classify under any of the accepted text-book heads. Dr. A. MONCRIEFF and Dr. C. F. HARRIS discussed the cause of hæmolysis of the blood and the consequent physiological jaundice in the new-born. Dr. E. H. RAINEY mentioned some of the contra-indications to operation, either in congenital obliteration of the bile-ducts, or in any case of persistent jaundice of the catarrhal type. Dr. E. GUNN described an epidemic of catarrhal jaundice in New Zealand, and Dr. J. HUTSON described the high incidence of physiological jaundice of the new-born in Barbados.

REVIEWS AND NOTICES OF BOOKS

Clinical Observations on the Surgical Pathology of Bone.

By DAVID M. GRIEG, M.B., C.M., F.R.C.S. Edin., F.R.S.E., Conservator of Museum, Royal College of Surgeons, Edinburgh; formerly Surgeon, Dundee Royal Infirmary. Edinburgh: Oliver and Boyd. 1931. Pp. 248. 30*s.*

Surgical Pathology of the Diseases of Bones.

By A. E. HERTZLER, M.D., Surgeon to the Agnes Hertzler Memorial Hospital, Halstead; Kansas Professor of Surgery, University of Kansas. London: J. B. Lippincott and Co. 1931. Pp. 270. 21*s.*

IT is an achievement for any author to retain the interest of his readers almost from cover to cover. Mr. Grieg certainly does this in his book, in which he sets out to simplify the conception of bone affections. Yet when we reflect on its contents we find ourselves inquiring in what respect light has been thrown upon osseous pathology. It is a book with one idea; much generalisation is done from the simple observation that hyperæmia often accompanies bone absorption, and that diminished blood-supply, when calcium is available, accompanies bone formation. There are no facts brought forward to support this hypothesis. Local concentration of calcium is postulated as necessary for bone formation, but the author provides no evidence that there is actually increase of calcium in the soft tissues in the vicinity of a fracture. He does not tell us of the possible part played by phosphatase, by glucose or the parathyroid glands. We read that the neck of a fractured femur when broken is absorbed because of increased blood-supply, that osseous union would occur when this dies down, were it not that "fibrinous exudation and the local excess of calcium is wasted by falling into the articular hæmosynovial effusion." The explanation of the formation of true bone in a laparotomy scar on page 15 is ingenious and full of interest, and is a good example of how the reader's attention is fixed and retained. On page 75 there is a fanciful explanation of the so-called expansion of bone. By decalcification the bone is said to become a softened tube, and inflammatory hyperæmia and exudation is held actually to distend it. The explanation of bony secondaries in sarcomata on page 240 is quite startling. The pictures of specimens of dried bones are extremely well executed, and the production of the book does credit to the publishers.

It cannot be said of Dr. Hertzler's book that it holds the interest of the reader. It purports to treat, in a comprehensive manner, the pathology of diseases of bone, and the author confesses that all his resources have been invoked in its compilation. It is the more to be regretted that the result is disappointing. The work provides but meagre information on quite common affections; for instance, rickets is dismissed in eight lines, whilst scurvy occupies but six. Achondroplasia, it is true, is a rare disease, and not of much surgical importance, but it would seem to deserve more than four lines, if worthy of mention at all. In the account of exostoses no reference is made to hereditary proclivity or to the views put forth by Sir Arthur Keith; while the recent work which has done so much to enlighten the pathology of osteitis fibrosa finds no place.

These random examples of defects have been cited in order to justify the criticism of this book as one which fails to reach the average standard of modern surgical literature.

The Mental Defective.

By RICHARD J. A. BERRY, M.D., F.R.C.S., F.R.S.E., and R. G. GORDON, M.D., D.Sc., F.R.C.P.E. London: Kegan Paul, Trench, Trübner and Co., Ltd. 1931. Pp. 196. 8*s.* 6*d.*

IN a preface, the authors state that they have written this book in response to the demands of representatives both of the medical and lay public for a small popular work which would elucidate the growing problem of mental deficiency as seen in its legal, magisterial, social, and educational aspects. They have produced a readable and vigorous book, which, in under 200 pages, touches upon a wide range of subjects. In the compass of eight chapters, they discourse upon the evolution, anatomy, histology, and physiology of the central nervous system, the nature of instincts, the legal and medical approaches to the problem of defectiveness, the principles of heredity as applied to animals and man, the relationship of mental defect to other forms of illness, and the social consequences of mental deficiency. And in the last chapter they advance a remedial policy.

In their treatment of the subject from the medical aspect, the writers stress their belief that the essential characteristic of mental deficiency consists of a paucity of brain cells. This, they hold, reveals itself in a tendency towards microcephaly, observable in two-thirds of all mental defectives. In fact, such universality is attributed to this characteristic that they consider that "the time has surely come when 'microcephaly' as a 'type' of mental deficiency should disappear from medical text-books."

In approaching the question from the social aspect, a strong plea is made for an evaluation of mental deficiency in terms, not of scholastic educability, but of adaptability and social efficiency. The system of the self-supporting colony is advocated, not only for the four legally recognised categories of defectives, but also for a fifth group of "borderline normals" of a mental ratio of round about 70. For this group, a period of residence in a "therapeutic colony" is advocated. Here the doubtful case would, for a period, be retained under observation, with a view to determining his fitness for ultimate certification or eventual freedom.

Throughout the book emphasis is laid on heredity as the most important single and discoverable cause of mental deficiency, and control of immigration, more discriminating marriage laws, a quickened eugenic conscience, sexual segregation, and sterilisation are recommended as preventive measures.

The book contains much that will provoke dissent, and much that will arouse social and religious prejudices. It also runs counter to orthodox teaching on many points. It will probably commend itself to many who are dissatisfied with the sociological results of the methods of tackling the problem which have hitherto found favour, and will stimulate to fresh energy those who are convinced that these are on the right lines.

Étude clinique de la tuberculose infantile.

By JEAN LEVESQUE, Médecin des Hôpitaux de Paris. Paris: Masson et Cie. 1931. Pp. 150 and plates. Fr.22.

IN this small handbook the author has attempted a general survey of infantile tuberculosis in its clinical aspects. After a preliminary chapter on ætiology and pathological anatomy, he deals with primary infection and reinfection, and surveys, at some length, the well-known signs of infantile tuberculosis; he then goes on to discuss the modern methods of diagnosis, such as radiology and tuberculin testing. The last two sections are devoted to an exposition of the differential diagnosis and prognosis of infantile tuberculosis. The book closes with a small collection of well-reproduced radiograms.

The book is written in clear, interesting style, and, in spite of the fact that he has covered a very large amount of ground in the space of 150 pages, the author has succeeded in avoiding the errors of condensation which so frequently make this kind of book dull reading. Recent works, such as the Mantoux test with tuberculin and the researches of the French school of bacteriologists on the filterable virus in relation to heredity, are described, and the various modern treatments, such as ultra-violet rays, heliotherapy, B C G vaccine, are briefly touched upon. On this last point the writer is guarded in his views, and has managed to keep the question within the limits of a few short paragraphs. It is rather a pity that the brief statistics given towards the end of the book are not more recent, especially when there is such a wealth of material nowadays to choose from. A short, wisely selected bibliography, and a subject-index would have enhanced the value of the book considerably.

Prosthetic Dentistry.

By IRA GOODSELL NICHOLS, D.D.S., Lieutenant-Commander, Special Lecturer and Instructor in Dental Prosthesis, Dental Department, United States Naval Medical School. With many collaborators. London: Henry Kimpton. Pp. 687. With 830 illustrations. 50s.

DENTAL prosthesis more than any other branch of dentistry has become the battlefield of a large number of theories on occlusion and the movements of the condyles in mastication. Many highly elaborate instruments have been devised to imitate the condylar path; most of the theories are based on hypotheses which still require proof. Prosthetic dentistry has not received so much attention as other branches in the current literature on dentistry, although its practical importance is even greater than any other branch of operative dentistry. This volume, which is written by 45 dentists, illustrates both the merits and demerits of a composite work. Consisting as it does of a large number of sections, the reader loses the straightforward presentation of the subject which is possible when such a book is written by one man. On the other hand, few dentists can be equally knowledgeable in all branches of dental prosthesis, so that the work gains by the collaboration of a large number of experts. In this case we doubt if the gain compensates for the loss. The book is good in many respects; it is well written, beautifully illustrated, and, on the whole, clear; but it is a little disjointed. Dental prosthesis is essentially a practical subject. It calls for precise work, and needs craftsmanship. Such a subject requires to be methodically treated in sequence of the order of the work, so that the reader can readily follow the technique described. The various sections are good, but a certain lack of editorial control is apparent. Too much latitude has been given to the exponents of different methods, with the result that the reader is likely to be confused rather than edified. Moreover, so much space has been devoted to the more abstruse side of dental prosthesis that some of the more practical aspects are cursorily treated. Springs for the retention of complete dentures are no longer used to the extent common in the past, but they still have their place. Yet the only account of them given here is in the section devoted to restorations of deformities of the jaws following operation, and consists of but a few lines. The dentist desirous of learning the practical points involved in the fitting of springs in a full set of dentures would consult these pages in vain.

The book contains much that is of value, but it must not be regarded as a complete text-book of dental prosthesis. It is essentially one for the practitioner rather than for the student.

THE LANCET.

LONDON: SATURDAY, AUGUST 8, 1931.

ECONOMY IN THE SOCIAL SERVICES.

THE report[1] of the Committee on National Expenditure, appointed last March by Treasury minute with Sir GEORGE MAY as chairman, faces the disagreeable fact that public expenditure is too high and must be brought down to a lower level. The policy of retrenchment after the war was replaced in 1924 by a policy of expansion and development which added about 130 million pounds to our national expenditure as compared with that of seven years ago. Housing schemes, extended old-age pensions, beet sugar subsidy, widows' pensions, naval building programmes are only a few items in a long list. To the extent of about 20 million pounds a year we are now leaving posterity the cost of providing our own generation with these benefits. Future revenue is being mortgaged in spite of the practical certainty that by reason of the change in the age of our population the workers of the future will have to support a larger proportion of pensioners. The committee fears that the mass of the electorate does not appreciate the true economic position of the country, the struggle between expansion and retrenchment at election times always being heavily weighted by the better organisation of those who desire increased expenditure on particular objects.

Looking round for victims the Committee regards it inevitable that the chief opportunities of reduction should be found in the services of most rapid and recent growth. Although they attempt no definition of the category of social services, it is admitted that about 80 million pounds of the increased expenditure of the last seven years can be ascribed to their development, whether under government administration or control of local authorities. The majority report, signed by four members and the chairman, frankly gives the enormous increase in the exchequer charge for these services as the prime cause of the present financial crisis. Had it been possible to make sufficient reduction in other fields of expenditure they would gladly have been content with comparatively minor adjustments in this field. But after curtailing unemployment benefit, docking teachers' salaries, cutting down the road fund, and putting back army pay to the 1925 level, they are still obliged to suggest economies under the heading of national health insurance and of the maternity scheme which are peculiarly unwelcome to the profession of medicine. The lion's share of saving on the former is to come out of the pockets of the doctors, and the Committee is unanimous in suggesting a reduction of the capitation rate. Paragraph 409 runs as follows :—

> We are however of the opinion that the payments to the doctors are too high in present circumstances. These consist of a flat capitation allowance of 9*s.* per annum for every insured person in a doctor's list in addition to mileage allowances in rural areas, amounting in the aggregate to £250,000 and equivalent on the average over the whole of the medical panels to about 4½*d.* per insured person. It is common knowledge that the standard of remuneration of the medical profession has been greatly increased as a result of the Health Insurance Scheme and there has been growing difficulty in filling salaried medical posts under the Government and the local authorities at rates of pay corresponding to those in other classes of public service. In present circumstances we should not regard a reduction of the capitation rate to 8*s.* as unreasonable. This would represent a saving to the scheme of about £750,000 and enable it to meet the cost of central administration to this additional amount.

The suggestion of difficulty in filling salaried medical posts is, we find, a little belated. Like everything else the value of panel practices has been declining, and many recent appointments to government services have been filled by candidates who have disposed of practices with large panels because they have become less remunerative. The other economy suggested is the elimination of the grant of a quarter of a million pounds to the central fund which enables the less fortunate approved societies to pay their prescribed benefits, although an extended application of the principle of pooling of benefits is regarded as very desirable. The richer societies are in a position to maintain their additional benefits, and even to extend their scope, while other societies are in danger of being unable to maintain even the statutory rates of benefit. The chief factor in this difference is, in the Committee's view, not good or bad administration but differing health and unemployment risks of the members in the separate societies.

The maternity scheme is dismissed in the majority report as unduly ambitious in scope and containing the undesirable principle of differentiation between those who belong to the state insurance scheme and those who do not. The probable exchequer charge for this scheme of 1½ million pounds cannot be justified in the present financial circumstances. But to this economy the two Labour members of the Committee are dissentient, regarding the scheme as a bare minimum of requirement to meet the disturbing facts revealed in the departmental committee's report. They recall the fact that it was only in 1926 that the exchequer grants to insurance funds were reduced by a sum substantially larger than the annual additional charge necessary to provide these maternity services. As to health insurance the minority report agrees that provision should be made from within the insurance fund to maintain the statutory rates of benefit, if necessary by a direct levy on the disposable surpluses of societies. The two signatories possibly overlook the fact, made clear in the main report, that these surpluses are the property of the members, representing a reserve consisting of the excess value of the contributions made by each person in his early years over the benefits received by him. In the case of both majority and minority reports the proposals are made with frank regret that it is not possible to arrange for all classes of the community to suffer an all-round reduction of income. The majority report revolts from singling out public servants and pensioners from the rest of the community for special sacrifice; the minority report turns to an adjustment of taxation in relation to the uncovenanted benefits, now being received by the holders of fixed incomes, as a direction in which further hardship may be avoided to those least able to bear it.

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[1] Cmd. 3920. H.M. Stationery Office. 1*s.*

THE MEANING OF "DENTAL SURGEON."

THE connotation of "dental surgeon" is presumably a question of fact. The question has just been answered by Mr. Justice Farwell in the Chancery Division. Leave to appeal against this important decision has been granted.[1] In order to appreciate the importance of the case it is necessary to remember that the titles "dentist" and "dental practitioner" are statutory descriptions. Provided that he is on the register, a dentist may use them whether or no he has a degree or diploma. There is a third description, "dental surgeon," which is not mentioned in the Dentists Acts, but is widely understood to imply the possession of degree or diploma. If this understanding is sufficiently well founded, any registered dentist who calls himself a "dental surgeon" without possessing a degree or diploma offends against Section 4 of the Act of 1921; he is using a title or description which, in the words of the section, is reasonably calculated to suggest that he possesses a professional status or qualification other than the professional status or qualification which he in fact possesses.

In the recent Chancery proceedings, the Attorney-General, on the relation of the British Dental Association, brought an action against a dentist practising at Norwich. The defendant possessed neither degree nor diploma. The Attorney-General asked for a declaration that the defendant's use of the title "dental surgeon" was reasonably calculated to suggest that he possessed a professional status or qualification which he did not in fact possess; he also asked for an injunction to restrain the defendant from using the title. The defendant pleaded that he was entitled to use the description. The plaintiffs called several witnesses practising as dentists in various parts of the country, who said that to them the title "dental surgeon" implied a decree or diploma; they had known "1878 dentists" who used it but no "1921 dentists" other than the defendant. The Secretary of the Incorporated Dental Society, and other witnesses for the defendant, said that all persons practising as dentists in industrial districts called themselves "dental surgeons"; if they had degrees they indicated the degrees on their signs. "Dental surgeon," they said, meant no more than dentist. Counsel for the defendant pointed to the use of the words "dentistry" and "dental surgery" in the 1878 Act as if they were synonymous. He argued that a man qualified to practise dental surgery might reasonably call himself a dental surgeon; the "1878 dentists" used the title "dental surgeon" though they had no degree. Mr. Justice Farwell granted the declaration and injunction in the terms of the application. He inferred from the evidence that to many people "dental surgeon" had a definite meaning and that to many it had none. He could not neglect the evidence for the plaintiffs. The question of the title of "dental surgeon," he said, had been a moot point before 1921; if the legislature had meant the title to be used by the newly registered class, it could have inserted the title in Section 4 of the 1921 Act, along with "dentist" and "dental practitioner."

Many who recall the genesis of the 1921 Act would deem it unfortunate indeed if this decision should be overruled on appeal. The need of proper care and treatment of the teeth is by no means fully realised by the public, though the lesson is being steadily spread. If the necessary recruits are to be attracted to the dentist's profession, it is a mistake to neglect or obscure the evidence of the student's training. The profession has had to fight for its standards. There has been a long struggle against the ingenious use of unjustified titles and descriptions. The Act of 1921 was not ungenerous to persons previously unregistered. Sir Norman Bennett had explained to the Acland Committee, whose report led to the passing of the Act, that many existing practitioners deemed it inequitable to take away their exclusive right to the title of "dentist" and to give that title to persons then not on the register. But it was hard to invent an alternative description. He realised, he said, that persons on the register must have some title or other, and he could suggest nothing but the dictionary word "dentist." Little mention was made to or by the Acland Committee of the description "dental surgeon." But, then as now, those who are in the best position to know have no doubt that the description has a special meaning. If it really has no meaning at all, perhaps there would be less inclination to usurp it.

THE RENAL LESIONS IN BRIGHT'S DISEASE.

BRIGHT'S method, his great legacy to medical science, was the explanation of disease by a reference to morbid anatomy. This is the ideal which the authors of an important monograph[1] recently published have set before themselves. It contains the results of a combined investigation by a physician, Prof. THOMAS ADDIS, and a pathologist, Prof. JEAN OLIVER, of 72 cases of Bright's disease, in an attempt to correlate the clinical manifestations of the disease with the structural alterations occurring in the kidney. Impressed, as many others have been, by the relative failure of the study of renal function to solve the problems of nephritis, the authors have eschewed all but the simplest functional tests and have relied for their diagnosis of the clinical condition of the patient on the case history, the physical examination, and the study of the urinary deposit. Prof. ADDIS has already shown how illuminating the study by an expert of the urinary deposit may be, and in the present work he constantly emphasises its importance. He insists that the clinical intuition which is so important in other branches of medical practice constantly fails when applied to the complex condition known as Bright's disease so that even masters of the art are frequently misled.

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[1] A verbatim report of this important case will appear in the next issue of the British Dental Surgeon, the Journal of the British Dental Association.

[1] The Renal Lesions in Bright's Disease. By Thomas Addis, Professor of Medicine, Stanford University; and Jean Oliver, Professor of Pathology, Long Island College of Medicine; formerly Professor of Pathology, Stanford University. New York: Paul B. Hoeber. 1931. Pp. 686. 170 full-page plates. 21 text illustrations. $16.00.

> "They are misled because of the great variability of the manifestations of Bright's disease in the different tissues and organs of the body, so that it is seldom safe to deduce the state of the kidney from observations on the vascular, hæmopoietic, or nervous systems, or wise to form a judgment as to the predominant renal lesion even from the sum of all that by means of present clinical methods is seen, felt, or surmised. But, principally, they are misled because for many years they themselves have ceased to study the urine which comes from the diseased kidneys of their patients. They deal only with symbols transmitted to them by hurried and machine-like technicians, although within that urine which they never see is contained all the direct evidence as to the nature of the renal lesion."

Prof. ADDIS's method consists essentially in the determination of the functional capacity of the kidney, or the extent of the renal lesion by a comparison of the rate of urea excretion with the blood-urea concentration; and an estimation of the nature of the renal lesion by the amount of protein excreted and the examination of the urinary deposit. To be of value the urine examinations must be controlled and carried out by an expert. Inasmuch as protein, casts, and blood occur in the urine of healthy people, the diagnosis of Bright's disease becomes a quantitative one and rests upon the demonstration of larger quantities of protein and casts than occur within the range of normality. The need for accuracy in the investigations is, therefore, of the greatest importance, and this is especially so in the examination of the urinary deposit, for casts and cells vary in form and number with the concentration and reaction of the urine, and the red corpuscles which are the key to the situation may be so distorted as to escape recognition by anyone but an expert in this technique. Moreover, as Prof. ADDIS frankly says, the method has its limitations. The formed elements of the urine merely represent waste products of active lesions and give no indication of the important progressive or proliferative changes which may be taking place in the kidney.

The pathological side of the investigation, carried out by Prof. OLIVER, has been strictly limited to the examination of the diseased kidney itself, for the renal lesion in Bright's disease was the subject of the investigation, and, moreover, in many cases only the kidneys were available for study. Inasmuch as the clinician considered both the nature and the extent of the renal lesion, it might be expected that the pathologist would do the same, but, as Prof. OLIVER points out, such a procedure at the present time is practically impossible. A qualitative histological study is comparatively easy, but a quantitative estimation of the renal lesions expressed in terms of functional capacity is an entirely different matter. It is easy, for example, to distinguish an inflammatory process in a glomerulus, but we have no means of determining how its power to excrete water is affected thereby. Prof. OLIVER has, therefore, limited himself to an objective description of the lesions he has observed, but his valuable chapter on pathological definitions suggests that had he been content to follow a less austere method he could have wandered far in the realms of theory.

As the result of his observations Prof. ADDIS has arrived at the following classification of Bright's disease: hæmorrhagic Bright's disease, of which the initial, latent, active, and terminal stages can be recognised; degenerative Bright's disease, including the cryptic, pyogenic, non-bacterial, and bacterial forms; and arterio-sclerotic Bright's disease; and the cases are grouped under these headings. The history and relevant clinical details of each case are given at length, and there is a brief discription of the naked-eye appearances of the kidneys and a detailed report on their microscopic structure. But the feature of the case records are the illustrations—the structure of each kidney is illustrated by two photomicrographs, one of a magnification of 20, the other of 125, so that the reader is able to see for himself the actual lesion associated with the clinical condition described. There are 142 of these plates, and they are admirably reproduced—the lower magnifications are sometimes a little difficult, but with careful study they will be found to fulfil the purpose claimed for them. These plates are not illustrations in the ordinary sense of the term; they "were not chosen to elucidate the text, but rather the text supplements, in its insufficient way, the actual images, as near as may be, which we had before us in our study." There are, however, in addition, 26 high-power drawings of frankly selected specimens chosen to illustrate the text. The book is concluded by short chapters summarising and correlating the clinical and pathological data.

It would be almost impertinent to offer praise to such an admirable example of what can be achieved, without dogmatism or bias, to clarify one of the most complicated problems in medicine.

ORTHOPÆDIC HOSPITALS.—A new orthopædic hospital, to cost about £30,000, is to be erected in conjunction with the Royal Victoria Infirmary, Newcastle-on-Tyne. On the ground floor will be demonstration and lecture rooms, consulting rooms, a gymnasium, accommodation for hydrotherapy, a sunlight ward, a radiant heat ward, massage rooms, and dressing rooms. Wards for patients and accommodation for sisters will be on the first floor, the second floor will be given over to wards for the reception of women and children patients, and the third floor will include an operating theatre, plaster room, and store rooms. From each ward there will be access to sun balconies, and the flat roof will be used as a roof garden, for treatment of patients in the open air.—Mr. H. J. Alpass, M.P., recently opened a new out-patient department of Bristol Orthopædic Hospital to meet the demand for accommodation. Out-patient attendances have grown from 4137 in 1912 to 13,156 in 1930; in addition, there were 3305 attendances at the Bedminster branch. The work has cost £5500.

ANNOTATIONS

CLINICAL TRIALS OF NEW REMEDIES.

THE Medical Research Council announce that they have appointed a Therapeutic Trials Committee, as follows, to advise and assist them in arranging for properly controlled clinical tests of new products that seem likely, on experimental grounds, to have value in the treatment of disease :—

Prof. T. R. ELLIOTT, Physician to University College Hospital, London (Chairman).
Sir E. FARQUHAR BUZZARD, Regius Professor of Physic, University of Oxford.
Dr. H. H. DALE, Sec.R.S., Director, National Institute for Medical Research.
LORD DAWSON OF PENN, President, Royal College of Physicians, London.
Prof. A. W. M. ELLIS, Physician to the London Hospital.
Prof. F. R. FRASER, Physician to St. Bartholomew's Hospital, London.
Sir JOHN PARSONS, Ophthalmic Surgeon to University College Hospital, London.
Dr. J. A. RYLE, Physician to Guy's Hospital, London.
Sir JOHN W. THOMSON-WALKER, Consultant Urologist to King's College Hospital, London.
Mr. WILFRED TROTTER, Surgeon to University College Hospital, London.
Prof. D. P. D. WILKIE, Surgeon to the Royal Infirmary, Edinburgh.
Dr. F. H. K. GREEN (Secretary).

Conditions have been the subject of discussion and agreement between the Medical Research Council and the Association of British Chemical Manufacturers, under which the Therapeutic Trials Committee will be prepared to consider applications by commercial firms for the examination of new products, submitted with the available experimental evidence of their value, and appropriate clinical trials will be arranged in suitable cases. The Committee will work in close touch also with the existing Chemotherapy Committee, who are engaged for the Medical Research Council in promoting researches aimed at the discovery and production of new remedies.

The Therapeutic Trials Committee will invite suitable experts in particular branches of medicine or surgery to undertake the clinical tests of preparations accepted for trial. The reports of the results will be published under the authority of the Committee.

THE TRANSMISSION OF CHOLERA.

DURING the 50 years 1877–1927 there was no striking reduction in the recorded mortality from cholera in British India, and no decline in either the frequency or intensity of epidemics. Stricter and more energetic control has had to contend with improvement in transport and consequently wider spread of infection, and the mortality is still round about 300,000 per annum. This comparative failure has led Lieut.-Colonel C. A. Gill and Dr. R. B. Lal to undertake a detailed study of the epidemiology, and they have done so from a new aspect.[1] They started with a working hypothesis that the house-fly is a link in the chain of infection—not merely as a mechanical agent in the pollution of food and drink, but as a true biological carrier in which the cholera vibrio undergoes development. Dr. Lal, who was responsible for the laboratory work, found that the vibrio seemed to disappear from the body of the fly after 24 hours, only to reappear about the fifth day, when the fly was infective through its fæces. He and Colonel Gill are not yet convinced, however, that any part of the life cycle is passed in the fly, and their theory is so far only a theory, though an interesting one. The bulk of their paper is devoted to an account of cholera epidemics in the Punjab from 1924 to 1929. They distinguish two different types of outbreak—a "protracted" type, with slow onset and diffuse distribution, and an "explosive" type which is sudden, sharp, and circumscribed. The difference may be put down either to changes in virulence or to dissimilar modes of transmission. As a sidelight on native lack of sanitary sense, they mention a case where the clothing of a traveller, who died of cholera in a hitherto uninfected village, was washed in the well which provided the main water-supply, with the result that within 24 hours there were 180 cases with 16 deaths. Efficient control is inevitably difficult in circumstances like this, but Gill and Lal think that cholera is not permanently endemic in any part of the Punjab, and that imported cases from the United Provinces and Hardwar are mainly responsible for periodical outbreaks. Cases also arise from the Himalayan region, where cholera may persist throughout the winter and break out in epidemic proportions in the following spring. "Acute" carriers are, in their opinion, much more often responsible for outbreaks than "chronic" carriers. It appears that water-borne infection is comparatively rare in the Punjab; indeed, it is said to account for only 2·5 per cent. of all outbreaks. It is significant that no great fall in the cholera death-rate has followed the installation of piped-water suppliers. The investigators are convinced that the institution of an efficient collection and disposal system for night-soil is of prime importance in the control of the disease.

THE AGED HEART.

ALTHOUGH the expectation of life has been appreciably lengthened in recent years, most of this gain has been made by the decrease in infant mortality and it hardly affects the outlook in adult life. Since a large proportion of the deaths of older members of the population are certified as due to heart disease much interest attaches to F. A. Willius's investigation[1] of the heart in an unselected group of patients aged 75 or more. Although it is now generally considered that the normal blood pressure does not vary much from youth to old age, three-quarters of the 700 men and women studied had a systolic blood pressure of over 140 mm. of mercury; in only 10 per cent., however, was this over 200 mm. and in only 40 per cent. did the diastolic pressure exceed 90 mm. Further the majority of those with hypertension were in the younger age-groups (75–80). Hence one may say that while in old age a certain amount of hypertension is the rule, a normal blood pressure is favourable to still longer life. Fifty-five per cent. of the subjects showed clinical evidence of heart disease, and in almost all of them it was diagnosed as being either hypertensive or coronary in origin. The majority of those with signs of coronary disease suffered no anginal pain and in the whole series there was only one case of coronary thrombosis. This is in accord with other evidence that coronary thrombosis is commoner in younger people and suggests that those living beyond the normal span of life have coronary arteries with such a free anastomosis that arterio-sclerotic changes are comparatively easily compensated. The fact that only 12 per cent. of the whole group had congestive heart failure is further evidence that the heart that permits its possessor to live for more than 75 years is indeed an organ of peculiar quality.

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[1] Indian Jour. Med. Research, 1931, xviii., 1255.

[1] Willius, F. A.: Amer. Jour. Med. Sci., July, 1931, p. 1.

INTERNATIONAL UNION AGAINST VENEREAL DISEASE.

REPRESENTATIVES of 44 countries, members of either a Government, or of venereal disease departments, or of voluntary organisations recognised by Governments, form, it may be known, the Union Internationale contre le Péril Vénérien, and this body has for the past year been reviewing the general position in civilised countries with regard to venereal disease. The scope of the various schemes is seen to vary considerably, the complete scheme adopted in our own country contrasting with the more limited endeavours to arrest the spread of syphilis only. There has been considerable controversy on the Continent as to the extent to which State funds ought to be expended in the treatment of venereal disease. Scandinavian countries, for example, advocate the taking over by the State of the treatment of the patient until cure can be considered complete—this in the interests of preventive medicine. Other countries hold that measures to ensure the immediate disinfection of patients is all that the State ought to be required to provide. Reports have now been presented to the Union Internationale by Profs. Bayet, Jeanselme, and Jadassohn, resuming the general principles of antivenereal campaigns from social and individual points of view, with the result that the Union has decided to ask Governments, public authorities, and antivenereal associations to bring certain cardinal conclusions before the medical profession in their respective countries. These conclusions are as follows: that the contagiousness of the patient must be reduced in duration by immediate and intensive treatment, to be continued until the chances of reappearance are removed; that congenital syphilis must be met by systematic inquiry into family circumstances as well as by examination of patients, treating not only congenitally diseased children but parents before procreation, and the mother during pregnancy. The soundness of the conclusions is obvious, and the British Social Hygiene Council has requested their publication by the medical press of this country, as a proof of the practical interest now manifested throughout Europe in the endeavours to avert a social menace.

ESCAPE FROM SUNK SUBMARINES.

THE catastrophe of the submarine *Poseidon* has drawn general attention to the possibilities of escape with the aid of a respiratory apparatus. The principle underlying the submarine respirators—of which there are many patterns—is that the chief danger to be avoided is rapid decompression, with resulting air embolism causing paralysis or death. At a recent meeting of the Academy of Medicine in Paris, Dr. Guglielminetti[1] made the interesting suggestion that complicated apparatus may not, after all, be necessary for escape from a submarine which has rapidly sunk as the result of collision. He admits that our knowledge of the physiology of life at great depths is still very inadequate, but takes as his text the pearl-diver of the Indies. He points out that there is no danger from emboli at depths of less than 13 metres, and that below this depth their formation depends on the length of time that the man has remained under pressure. He also lays stress on the fact that the nitrogen of the air embolus is derived from the air breathed in, and expresses the opinion that a period of five minutes is not sufficient to charge the blood with enough nitrogen for the formation of emboli. If, therefore, the sailor can reach the surface within five minutes of being subjected to increased atmospheric pressure he will not run the risks of decompression. Pearl-divers descend quite as far as many submarines, stay there just long enough to snatch oysters from the rocks, and return rapidly to the surface. They arrive exhausted and suffocated, but they never show the phenomena of decompression. The human body can stand extraordinary pressures, because it is composed of 90 per cent. of water, and if the dangers of decompression could be averted the occupants of the submarine could rise to the surface without apparatus, just like the pearl-diver. Survivors of submarines destroyed during the war declare that they shot to the surface with great rapidity, and Dr. Guglielminetti calls for laboratory experiment to find whether it is not really possible for men caught in disabled submarines to take a deep breath and then let themselves rise to the surface without any further complications.

IRON IN THE BLOOD OF INFANTS.

Dr. Helen Mackay's report[1] on the nutritional anæmia of infancy is to a certain extent supplemented by a careful study of the iron content of the blood of infants by Dr. I. A. Kotikoff[2] of Leningrad. His observations were made on a group of 20 normal breast-fed babies, beginning at the end of the second week in life and continuing first at fortnightly and later at monthly intervals. The blood was obtained from a small incision in the heel and the iron was estimated by the Foweather method, a total of 119 estimations being carried out altogether. The adult standard of 50 to 60 mg. per 100 c.cm. was accepted for purposes of comparison and on this basis the iron content of the infants' blood quickly fell from a high level in the first few weeks to a subnormal level which persisted for the rest of the first year. The average in the first month for 14 infants was 61·8 mg. per 100 c.cm. and the lowest figure recorded was in the ninth month when it dropped as low as 38·7 mg. According to Kotikoff, it may be taken that after the preliminary period of about six weeks, during which the organism is adjusting itself to new conditions, the iron content of the blood lies between 40 and 45 mg. This figure for iron shows a close connexion with the figure for hæmoglobin and it is demonstrated that the amount of hæmoglobin expressed in milligrammes per 100 c.cm. is 1·87 times the amount of iron. Kotikoff has tried to discover why healthy breast-fed infants should all have a comparatively low blood iron. He admits that breast milk does not contain an adequate amount of this substance, but all these children, from the sixth month, and sometimes earlier, received a mixed diet with fruit juice, vegetable soups, and the like. He finds that the beginning of this mixed diet causes a temporary slowing of the gradual fall of blood iron and he thinks that further work will be able to show the importance of dietetic factors. The iron content was apparently not increased by ultra-violet irradiation or by cod-liver oil. A definite rise was noticeable towards the end of spring and Kotikoff thought this could be correlated with certain weather conditions. Carrying his biochemical investigations a step further he estimated the calcium and potassium content of the blood in some of these infants and found a definite relationship between these and the amount of iron present. He says that in the first year of life the iron divided by the calcium gives a factor of 3·89 and if this figure falls below 3·5 it indicates a definite pathological state. By studying the amount of iron in the blood month by month in individual cases he shows that the amount present is a good criterion of the infant's health and in a few cases in his series sudden changes were observed in association with passing illnesses. He argues from his results that from the very early days of infancy it is necessary to supply iron to the organism and he pleads for more research to discover the best way of giving it. The work of Dr. Mackay supplies an answer.

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[1] Bull. de l'Acad. de Méd., 1931, cvi., 21.

[1] See THE LANCET, July 25th, p. 185.
[2] Jahrb. f. Kinderh., 1931, cxxxii., 180.

DEVELOPMENTS AT HANWELL.

THE centenary of the Hanwell Mental Hospital was celebrated on July 29th by the opening of an admission hospital. As Dr. Adeline Roberts and other speakers pointed out, this hospital has, in the course of its history, been a pioneer in more than one direction. The name of Colonel Clitherow, the first chairman of the first visiting committee, is closely associated with the formation of the Queen Adelaide Fund, the first of after-care associations. The first superintendent was Dr. (afterwards Sir) William Ellis, a pioneer of "occupational therapy." He set the patients to trades and established a "bazaar," where the goods they made were sold, the proceeds being used for their benefit. As early as 1832 a consulting physician and a consulting surgeon were appointed. In 1839 the famous Dr. John Conolly became superintendent. He it was who abolished barbarous mechanical restraint, following the example of Pinel and Tuke. The hospital, originally built for 300 patients, now has 2400 beds, and during the war it actually accommodated 2750 patients at one time. Mr. L. G. Brock, the chairman of the Board of Control, in declaring the new admission hospital open, hailed the occasion as one of quite exceptional interest, because it combined a centenary—the triumph of antiquity—with the opening of an admission hospital, the triumph of modernity. He emphasised the fact that early treatment consisted both of earliness and of treatment, and deprecated the lip service paid by some people to the idea of early treatment by the provision simply of a place where the new admissions could be kept apart from the other patients. The real admission unit, the strategic centre of the whole organism, was a place where everything possible was done to alleviate the patient's condition and where he might find attractive and suitable environment. It was absolutely essential, he said, that the provision for early cases should be of a kind that would encourage them to apply for treatment, and that the treatment should be such that they would have faith that everything possible was being done for them. It was no use calling an institution a hospital unless it was permeated with the hospital spirit. He expressed his conviction that effort in this direction would be reflected in the recovery-rate, and cited the malarial treatment of general paralysis as sufficient answer to any pessimist.

The new villa is a detached, self-contained unit, to be staffed mainly by women nurses. It will provide accommodation for 50 men and 50 women, and is built mainly on one floor on three sides of a quadrangular courtyard. Each block has an examination room, a sick dormitory, a verandah, private rooms, and a solarium, and in the central block are kitchens and an association room common to both sexes. Special rooms for X rays, ultra-violet rays, and Plombières treatment are provided. The estimated cost of the villa, including its equipment and grounds, is over £53,000, and this building is the first item in a long programme of modernisation which the London County Council has decided to undertake in the oldest public mental hospital of the country.

HOUSING AND MALARIA.

A VALUABLE summary[1] prepared by Lieut.-Colonel Clayton Lane shows once more the importance of housing as a factor in the problem of malaria. It is well known that in areas where malaria is endemic certain houses acquire the reputation of being "malarious," from the fact that their inhabitants are frequently attacked by the disease, and the available evidence indicates that, in Europe at least, these houses have several characteristics in common. They possess rooms or landings which are dark, dirty, and often damp, qualities which appear to be attractive to malarial mosquitoes. The anopheles associated by experience with malaria are chiefly night-biting mosquitoes which attack their sleeping victims in their houses. The primitive house-dweller, it seems, often provides his own protection by building his house without a chimney, smoke being as offensive to mosquitoes as darkness is attractive; indeed, there appears to be reason to suppose that the invention of the chimney favoured the increase of malaria until a taste for larger windows came to balance it.

The suggestion that mosquitoes have an instinct to return to a pleasant hospice is only supported by questionable evidence, Colonel Clayton Lane says. Various experiments have been made, both in America and Kenya, by which anopheles were captured, sprayed with dye, and released at a distance from the site of capture, but these have not been carried out on a sufficiently large scale to be conclusive; the results indicate, at any rate, a tropism towards food. Nor is a stay-at-hospice habit invariable among anopheles; some species appear to leave the house immediately after feeding, while others remain in a sluggish state for some hours after feeding, and J. A. Le Prince in America found that children could be readily trained to kill every anopheles in the room. The importance of the destruction of replete anopheles as an antimalarial measure was demonstrated in the early days of the construction of the Panama Canal. The female anopheles is impelled to leave the house after feeding by the necessity for oviposition; during hibernation the insect does not feed and there is no oviposition, so that there is no danger of transmission of malaria. N. H. Swellengrebel has shown, however, that for *A. maculipennis* in Holland there is an intermediate condition, which he calls gonotropic dissociation, in which oviposition is in abeyance but feeding continues. When in this condition mosquitoes remain in the house where they have fed, and are capable of becoming malarious and transmitting the disease. Moreover, there is some evidence that anopheles sick of malaria become too sluggish and ill to leave the house for long at a time, and S. P. James describes them as finding a sheltered hole a few feet from the bed, from which they make a nightly sally to feed. The view put forward by E. Roubaud in 1919 that human beings are protected from malaria by the presence of animals in sheds or stables near the house has been considerably modified since then. He later declared that to be effective the animals must be housed in low, dark quarters free from draughts. Under conditions in which the human habitations share these same disabilities, however, Colonel Clayton Lane finds no satisfactory grounds for thinking that malaria-carrying anopheles prefer the blood of the animals to that of the men; he suggests by inference that to house man well is likely to prove a better antimalarial measure than to house animals badly. The value of screening of houses was established as long ago as 1900 when Sir Patrick Manson carried out his experiment in the Roman Campagna. The only protection employed by the experimenters was the adequate screening of their quarters, and not one of them acquired malaria, although they went about the country freely during the day.

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[1] Housing and Malaria. A Critical Summary of the Literature dealing with this subject. By Lieut.-Colonel *Clayton* Lane, M.D., I.M.S., retd. League of Nations publications, 1931, iii., 6. Obtainable in Great Britain from George Allen and Unwin, 38, Great Ormond-street, London, W.C. Pp. 43. 1s. 6*d*.

Colonel Clayton Lane's summary serves to collate the evidence that malarial infection is acquired essentially in the house. In his opinion the chief protective measures lie in suitable disposition of buildings relative to anopheline breeding places, in their proper construction, and where necessary in the use of screening.

SOME RECENT POLICIES REGARDING PARTICULAR DISEASES.

UNDER this title Sir George Buchanan delivered before the Section of Public Health of the British Medical Association a presidential address which deserved the marked attention of the audience, and which, we hope, will be available shortly, in the full text, through the columns of the *British Medical Journal*. The general message of the address was that in dealing with public health policies in regard to particular diseases we should rely for our procedure to an increasing extent upon local experiment, the panacea in preventive disease being found wanting in proportion as knowledge and experience grow. Few, indeed, are the diseases which the epidemiologist can hope to curtail in spread, or to bar from a given locality, by one general set of methods. Psittacosis forms a solitary example of a particular infection, where complete exclusion from our own country, even in modern circumstances of inter-travel, was attended with success; and psittacosis may be a comparatively trivial disease, but Sir George reminded us that it was none the less responsible for over 100 cases within a few months recently, with 25 deaths.

The occurrence of communicable diseases, and the complexity of their manifestation, leaves psittacosis in a class by itself; indeed, it is rare that even the main lines of policy, directed against a particular disease, can be so generally applicable as to result in homogeneous international action. Referring to the methods now being tried in many countries to combat malaria, Sir George reminded his hearers that public health authorities in various parts of the world at one time offered, as their single policy against the spread of malaria, activities based on the intensive local attack of the breeding-places of anophelines. We know how successful this policy has been in certain mosquito-ridden areas, but in others the circumstances of the area have produced different procedures of prevention as practical knowledge of malaria increased. The limitations of quinine, for example, which had been suspected by many, especially those whose war service brought them into malarial districts, are now recognised, and drugs have been utilised which meet some of these limitations; and, again, the work which has centred round the Horton Laboratory, where all phases of malaria are studied in association with the manifestations of general paralysis, has introduced a new phase of study. In further development of arguments against a general trust in any therapeutic or preventive procedure, because it has proved, and is proving, beneficial at certain times or in certain places, the lecturer commented on the variations of public health policy now adopted in dealing with yellow fever and leprosy, but he chose as his principal example of a definite change in scientific thought the views held now upon isolation, immunisation, and the influence of carriers, when considered in connexion with scarlet fever and diphtheria. The hospital isolation of scarlet fever he described as representing a social convenience—"any local area which has once possessed it would not willingly dispense with it"—but he found no evidence withstanding examination that the spread of scarlet fever has been checked by isolation, or that either the severity or mortality has been diminished. Practical experience may thus be confirming the conceptions of scarlet fever entertained by the immunologists. Both in scarlet fever and in diphtheria we have, the lecturer considered, justification of the isolation hospital as a place of treatment and of observation—"the accent is shifted from *isolation* to *hospital*." This view of isolation hospitals has led to study within their walls of a variety of different diseases, and the close association of these institutions with bacteriological and clinical research is full of promise, and is displaying performance. While the routine in connexion with the detection of carriers has been much dispensed with, bacteriological study has been largely directed towards the production of artificial immunity. For diphtheria, systematic immunisation is now an accepted policy among the staffs of hospitals for infectious diseases and in certain schools and institutions, and much work has been done in the same direction for scarlet fever, though an immunising agent requires here to do more than prevent uncomplicated manifestations of the disease, a difficulty which has also occurred with small-pox where vaccination is a standard form of successful immunisation.

Small-pox constitutes a good example of possible value coming out of intensive local investigations, because of the remarkable variations in severity which attend different local outbreaks. Sir George Buchanan pleads for the establishment of local centres of research, not only here, but in connexion with the prevention generally of the greater scourges. He suggests that in this manner some of the problems of acute rheumatism in children and of the increasing cancer death-rate might be helped towards elucidation. He advocated the setting on foot of local effort inspired by local enthusiasm, and closed his address with these words: "It seems, indeed, even from the random examples I have given, that in dealing with public health policies in regard to particular diseases we can hardly have enough local experiment." The sentence is significant, coming from one of the chief officers of our national health department—a department too often accused of aiming at bureaucratic centralisation.

THE DIFFERENTIAL DIAGNOSIS OF ANGINA PECTORIS.

IT is not so long since the clinical picture of coronary artery disease, with its many variations, has been rescued from the profusion of symptoms labelled indigestion and made into a clinical entity. To those who have worked hard to differentiate the syndrome, it is depressing to observe signs that in diagnosis its cardinal features remain unrecognised in many quarters. In an article entitled Referred Pain of Gastro-intestinal Origin Simulating Angina Pectoris,[1] Dr. Robert Palmer does not convince us that confusion in diagnosis need still occur, certainly not that the reaction of such patients to "continued gastric régime" must be studied before a diagnosis can be arrived at. It is certainly true that reflex gastric symptoms are common in cardiac pain, but the features of the pain are usually clear cut. Dr. Palmer does not take into account the possible occurrence of intermittent claudication of the mesenteric vessels, when the mesenteric arteries are affected by arterios-clerosis; this possibility, with its resulting digestive symptoms, should be borne in mind with all patients showing marked atheroma of other vessels. The cases supplied to illustrate difficulty of diagnosis are few and incomplete. We are not told the blood pressure in any one case; this is an important omission, since patients suffering from high blood pressure may complain of cardiac pain for some years. No mention is made of the Wassermann reaction in any case. It is acknowledged that it is possible to mistake pain of gastro-intestinal origin for angina pectoris, but the mistake should be rare, in the light of recent knowledge, among those familiar with the manifestations of coronary artery disease.

CEREBRO-SPINAL FEVER.

SOME of the problems which arise in the prevention and treatment of cerebro-spinal fever were considered in our issue of Feb. 21st. Readers who require further light on these difficulties will find it in a report[2] just published by the Ministry of Health, which deals with the transmission of the disease by carriers, the value of serum, the use of vaccines, and the measures to be taken with contacts. The treatment recommended, apart from good nursing, includes early and repeated lumbar puncture, to relieve pressure and to promote drainage of the cerebro-spinal system; in addition the use of antimeningococcal serum is advocated, to be administered, if possible, with the first lumbar puncture. The administration should be repeated at 24-hourly intervals until recovery appears to be well established and the cerebro-spinal fluid has become clear. It should not be discontinued if the first examination of the C.S.F. yields no meningococci; nor should lumbar puncture be delayed if serum is not immediately available. The amount of C.S.F. escaping after lumbar puncture in adults is commonly in the region of 50 to 70 c.cm., and the amount of serum injected should on no account exceed the amount of fluid withdrawn; 30 c.cm. of serum is given as the usual intrathecal dose for an adult, and it is best injected with the patient anæsthetised, since the pain may be considerable. With infants, who do not tolerate the injection of serum well, the use of an anæsthetic is considered inadvisable. Satisfactory results appear to have been obtained in Rumania by giving a daily intrathecal dose of polyvalent antimeningococcal serum combined with an intramuscular dose of about 60 c.cm. of the same serum for at least three or four days. In spite of the promising results of serum therapy in the early stages, it has undoubtedly proved useless in many cases, partly because of the difficulty of assessing the probable therapeutic efficiency of antimeningococcal serums by laboratory methods, and partly because of the multiplicity of strains of meningococci responsible for sporadic cases, and apart from the local strains recognisable during an epidemic. At the present time it is thought that reliance must be placed on polyvalent serums. Vaccines, it is stated, may be useful during slow convalescence, and should consist, if possible, of killed cultures of the patient's own meningococcus, given subcutaneously in fairly large doses, beginning with 250 millions. No satisfactory data exist as regards the use of vaccines in prophylaxis. The swabbing of contacts is advocated with a view to the detection of carriers. To be effective, swabs should be taken from the upper end of the posterior pharyngeal wall, and contamination with saliva should be avoided. Fresh air and exercise, without other treatment, have been found to be the best means of freeing a carrier of the meningococcus; the use of a fine vapour spray of zinc sulphate, 1½ to 2 per cent., directed through the nostrils and mouth to the nasopharynx, appears to have been beneficial in some cases.

AN ADVISORY COMMITTEE TO THE BOARD OF CONTROL.

THE Board of Control, with the approval of the Minister of Health, have appointed a committee to advise them on questions arising in connexion with scientific and ancillary mental health services. The members are: Mr. L. G. Brock, chairman of the Board of Control (chairman); Sir Hubert Bond, F.R.C.P.; Mr. Robert Bruford, J.P.; Mr. W. E. Lovsey, J.P.; Dr. T. S. Good; Dr. Adeline Roberts, J.P.; Mr. J. C. Grime, J.P.; and Prof. J. Shaw Bolton, F.R.C.P., with Mr. P. Barter as secretary. The Mental Treatment Act, which came into operation on Jan. 1st, confers upon local authorities powers to provide for out-patient treatment and for the after-care of mental patients, and, subject to the approval of the Board of Control, to undertake or to contribute to research in regard to mental illness. The Board have appointed the advisory committee to assist them in the consideration of schemes of research submitted for their approval, and in regard to such questions as the organisation of social services in connexion with out-patient treatment and after-care, on which local authorities may seek the Board's guidance. On technical questions relating to research the advisory committee will have the expert advice of members of the Medical Research Council's committee on mental disorders.

LONDON HOSPITAL SATURDAY FUND.—At a meeting of the council last week it was reported that the fund during the past year had decreased by £5000. The fall was explained to be due to competition from similar organisations and to the general financial stringency.

EXTENSION OF WORKSOP VICTORIA HOSPITAL.—A new wing of this institution was recently opened by Viscount Galway, to whose grandmother, Henrietta, Lady Galway, it owed its inception in 1867, and dedicated by the Bishop of Southwell.

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[1] New England Jour. of Med., 1931, cciv., 1351.

[2] A Review of Certain Aspects of the Control of Cerebro-spinal Fever in relation particularly to a scheme for collecting the results of serum treatment. Ministry of Health Reports on Public Health and Medical Subjects. No. 65. H.M. Stationery Office, 1931. Pp. 23. 6*d*.

SPECIAL ARTICLES

THE CEREBRAL CORTEX IN MAN.

PROF. FOERSTER'S LECTURES.

UNDER the auspices of the University of London an important series of lectures on the cerebral cortex was delivered recently by Prof. Otfrid Foerster of Breslau. Prof. Foerster is one of the foremost neurologists of the day and his work has always been distinguished by the contributions that he has been able to make from his study of patients to the anatomy and physiology of the nervous system. Although trained as a neurologist he has for many years done his own surgery, and during operations on the brain he has systematically developed the work of electrical stimulation of the human cortex begun by Horsley, Fedor Krause, Cushing, and others. It is safe to say that he is now without equal in his knowledge of this subject.

Prof. Foerster began by referring to the work of Oscar and Cécile Vogt. The Vogts have shown that differing motor effects obtained by stimulation of various parts of the cerebral cortex of animals correspond to differences in the arrangement, number, and morphological characters of the nerve-cells and medullated nerve-fibres in the various parts of the cortex. They have thus been able to divide the cortex into a number of sharply defined areas each giving a specific motor effect on stimulation and possessing its own specific architectonic structure. Prof. Foerster's results in man agree closely with those obtained by the Vogts and he employs the system of terminology that they introduced (see Figure).

The lecturer then proceeded to discuss various areas of the cortex in man. For each area he described the architectonic structure, the effects of electrical stimulation, the effects of irritation by pathological lesions, and the effects of partial or complete destructive lesions. In the surgical treatment of epilepsy he has frequently had occasion to stimulate and excise portions of the cortex. He has also observed with minute care the effects produced by tumours and other lesions of the cortex and in the course of these lectures he cited over 100 cases.

Precentral Gyrus.

Area 4.—The precentral gyrus in man is composed of two distinct areas: the area 4, which lies in and immediately in front of the Rolandic fissure, and a more anteriorly placed area called by the Vogts 6 a_α (see Figure). The area 4 gives origin to the fibres of the pyramidal tract. Stimulation of a point in this area by threshold galvanic stimuli, with the patient under local anæsthesia, or by faradic stimuli with the patient under general anæsthesia, produces an isolated movement of a single segment of the extremities or a single part of the trunk or head. In most instances the effect is on the opposite side, but stimulation of the parts supplying the upper part of the face, the pharynx, vocal cords, and the muscles for closing the jaw gives bilateral reactions. Occasionally stimulation of the areas for the trunk and thigh also produces bilateral movement. Stimulation of the area supplying the neck gives a response chiefly of the sternomastoid of the same side, the head thus being turned to the opposite side, and the external pterygoid muscle also has ipsilateral representation. The arrangement of the parts of the area 4 corresponding to the various movements is well known. In man there exist separate foci for each of the fingers and these occupy a relatively large part of the area. The focus of the fifth finger is the most superior, that of the thumb the most inferior. To obtain circumscribed effects by electrical stimulation in man it is necessary to use threshold stimuli and the surface of the convolution must be dry. Under such circumstances the effect of galvanic stimulation may be limited to a single muscle or even to part of a single muscle. It is thus clear that the precentral gyrus contains separate innervation not only for single muscle groups but also for single muscles. The threshold of these foci varies from one individual to another, the average being 1–2 ma. (milliampères).

Area 6 a_α.—In monkeys the entire surface of the precentral convolution is occupied by the area 4 and the area 6 a_α lies in the frontal convolutions. In man the area 4 lies chiefly in the Rolandic fissure and the area 6 a_α occupies the greater part of the summit of the precentral convolution. In man stimulation of points of the area 6 a_α produces the same isolated motor effects that are obtained by stimulation of the area 4, and there is the same detailed subdivision into foci for single segments of the limbs, but the threshold is much higher. These isolated effects from stimulation of the area 6 a_α are due to transmission of the stimulus to the area 4, for they are abolished by an incision into the cortex between the two areas, or by abrasion of the superficial layers of the cortex in the area 6 a_α. Under these circumstances, or if the pyramidal tract has been previously destroyed by disease, strong faradic stimulation of the area 6 a_α produces rotation of the head, eyes, and trunk to the opposite side (adversive movements), and the contralateral limbs carry out complex synergic movements of a flexor or extensor character. These movements are brought about by direct (extrapyramidal) innervation from the area 6 a_α to the subcortical and other lower centres.

Cases of Jacksonian epilepsy and of epilepsy produced by lesions in the precentral gyrus when the pyramidal tract had previously been destroyed were cited to confirm the results of stimulation. The lecturer then described a remarkable series of cases of destructive lesions of the precentral gyrus to show the essentially focal nature of the resulting paralysis when a limited part of the precentral gyrus was destroyed. Thus, from a gunshot wound affecting the medial part of each "motor" area in the paracentral lobules, a patient had bilateral spastic paralysis of both feet. The movements of the legs and thighs were not affected. This patient also had retention of urine. Prof. Foerster believes that the foci of the bladder and rectum lie in the paracentral lobule. Another case, of syphilis affecting one precentral gyrus, had spastic paralysis limited to one foot which superficially resembled a case of peroneal palsy. A case of meningioma of the falx cerebri observed through a number of years showed spastic paralysis of both legs and retention of urine. Gradually the paralysis extended to involve the muscles on the right side of the abdominal wall and diaphragm, the right shoulder and arm, and finally the forearm. The hand and fingers were never impaired. This patient never had headache or papillœdema. The case demonstrates clearly by the succession in which the different parts became paralysed the somatotopic focal subdivision of the precentral convolution. Another case of cortical lesion showed paralysis limited to supination of the forearm and extension of the wrist and fingers of one side. Cases in which the thumb or one or two fingers alone were paralysed were not rare, and isolated cortical paralysis of the interossei of one hand had also been observed. Excision of limited parts of the precentral convolution was followed by similar circumscribed focal palsies, but these were often more or less transient, especially in children. Recovery in such cases must be attributed to the more or less diffuse arrangement in the cortex of the motor foci of single muscle groups.

Frontal Convolutions.

Area 6 a β.—The area 6 a β (the frontal adversive field) occupies the posterior part of the superior frontal convolution. In man it does not react to galvanic stimulation even under local anæsthesia. Faradic stimuli of high intensity must be used. The effect produced is similar to that obtained by stimulation of the area 6 a α when the pyramidal tract has been destroyed—rotation of the head, eyes, and trunk to the opposite side and complex synergic movements of flexion or extension of the contralateral arm and leg. This response is still obtained after the areas 4 and 6 a α have been destroyed. Thus the area 6 a β has its own motor pathway to the subcortical centres. The movements obtained by faradic stimulation of the area are easily converted into an epileptic attack, and attacks of exactly the same type are produced by many different pathological processes involving the area 6 a β. Most of the cases cited had been completely relieved of their fits by excision of the area and this procedure was not followed by any recognisable defect of motility.

Area 8 αβδ.—This area (the frontal eye field) occupies the posterior part of the second frontal convolution. In many cases it reacts to galvanic stimulation (threshold, 4·0 to 8·0 ma.), but in other cases faradic current is necessary to obtain an effect. The response is an isolated movement of the eyes to the opposite side, and occasionally also in an upward direction. Strong faradic stimulation produces a convulsion, which may be limited to the eye muscles, but in most cases other movements occur, indicating a spread of the stimulus to the area 6 a β or to the areas 6 a α and 4. These attacks may be confused with attacks originating from the area 6 a β unless it is recognised that the fits begin with clonic movements of the eyes to the opposite side and only later involve the muscles of the head, trunk, and limbs. Pathological lesions of this area produce fits similar to those observed experimentally. Excision of the area is in some cases followed by more or less complete paralysis of lateral movement of the eyes to the opposite side, but this is temporary.

Area 6 β.—This small area occupies the most inferior part of the precentral convolution. Electrical stimulation of it produces rhythmic coördinated movements of the lips, tongue, mandible, pharynx, and larynx. The area appears to be unique, inasmuch as stimulation of it by a continuous galvanic current produces rhythmic movements, and the effect outlasts the stimulus. No other area of the cortex behaves in this way. Epileptic convulsions originating from the area 6 β begin with the same type of movements—chewing, licking, swallowing, and grunting movements—but in most cases the attack spreads to the adjacent areas 4, 6 a α and to the postcentral convolution.

The Postcentral Convolution.

Area 3, 1, 2.—The area 3, 1, 2 occupies the postcentral convolution and extends to the median surface of the brain, where it occupies the posterior part of the paracentral lobule. Faradic stimulation of the area is followed by paræsthesias, seldom by pain, in different parts of the body. The area shows a detailed somatotopic subdivision into a large number of sensory foci, each of which represents a special segment of the limbs or a special part of the body. The arrangement is in the same order as in the precentral convolution. Motor effects also follow stimulation of the postcentral convolution. They are obtained best by galvanic stimulation and are of the same isolated character as the effects obtained by stimulation of the precentral convolution, but the threshold is 2–4 ma. higher. They depend on the integrity of the area 4 and of the pyramidal tract. If either of these is destroyed no isolated motor effect can be obtained from the area 3, 1, 2, but strong faradic stimulation may still produce complex movements identical with those obtained by stimulation of the area 6 a β. Fits produced by lesions in the postcentral convolution begin with focal paræsthesias which spread. Motor discharges may then occur, usually at a distinct interval after the wave of paræsthesia.

A number of cases illustrating sensory disturbances by lesions of the postcentral gyrus were cited to show that focal lesions affect the sensibility of limited areas of the limbs and trunk. Thus, in one case of traumatic injury showing sensory Jacksonian attacks beginning with paræsthesias in the ring and little fingers, the disturbance of sensibility was limited to these two fingers. In many such cases of circumscribed lesions the anæsthesia of the extremities is limited by a circular line, but in others the areas of anæsthesia occur in the form of bands and strips along the extremities (anæsthesia of the axial type). It is possible that each sensory focus in the postcentral convolution is subdivided into anterior and posterior parts, the former corresponding to the lateral, the latter to the medial half of the segments of the extremities.

Loss of sensibility following destructive lesions of the postcentral convolution is recovered from to a considerable degree, and this is partly due to the fact that some afferent pathways do not cross, but end in the cerebral hemisphere of the same side. The intact hemisphere may substitute for the impaired hemisphere to a certain extent. But even in bilateral postcentral lesions a certain degree of recovery may be observed. This is explained by the fact that sensory areas in the cortex are not limited to the postcentral convolution. The superior parietal lobe is certainly part of the sensory cortex in man. The work of Dusser de Barenne in monkeys suggests that the sensory cortex has a wider distribution than hitherto supposed, but so far Prof. Foerster has no evidence that areas other than those described above contribute to the sensory cortex in man.

Destruction of the postcentral convolution is followed by disturbance of mobility as well as by defects of sensibility because coördination of movements depends on the integrity of the afferent pathways. Various types of ataxia occur.

Parietal Lobe.

Area 5 a.—This relatively small area lies in the upper part of the superior parietal lobe, immediately behind the postcentral convolution, and extends to the median surface of the hemisphere. In man it reacts in most cases only to faradic current, but in a few cases galvanic stimuli of high intensity (6-10 ma.) are also effective. Motor and sensory effects are observed. The motor response consists of complex movements of the opposite arm and leg similar to those obtained from the area 6 a β; but in addition the arm and rarely the leg of the same side also take part in the movements. Furthermore, if stimulation is limited to the area 5 a and does not radiate to the area 5 b the head and eyes are not turned to the opposite side. The sensory effect consists of widespread paræsthesias and sometimes pain appearing simultaneously in the trunk and limbs of the opposite side, and sometimes also in the bladder and *rectum*. Epileptic attacks originating from lesions of this area are often preceded by a sensory aura which differs from that occurring in lesions of the postcentral gyrus, in that it involves the various parts of the opposite half of the body simultaneously rather than successively. The motor manifestations of these fits are similar to those obtained by stimulation of the area. Excision of the area 5 a is followed by defects of sensibility.

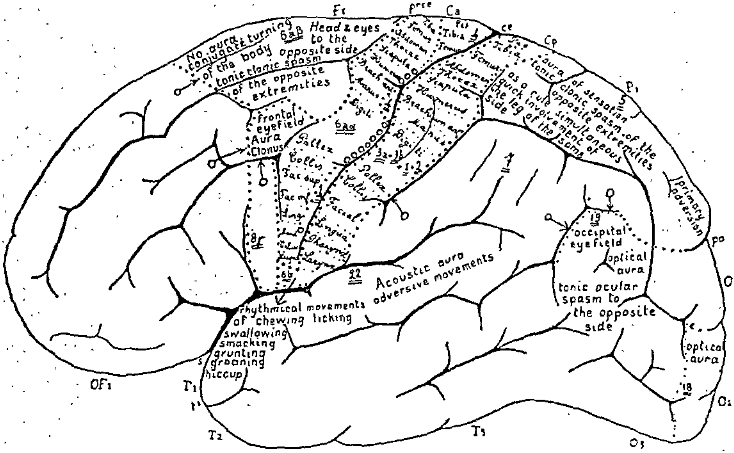

Diagram modified from an illustration in a paper by C. and O. Vogt in "Die Naturwissenschaften" (1926, xiv., 1101, published by Julius Springer, Berlin). A similar diagram was used by Prof. Foerster in his lectures.

Area 5 b.—This is a large area in man, and occupies the greater part of the superior parietal lobule and precuneus. It reacts to strong faradic currents only. The primary motor effect is deviation of the head and eyes to the opposite side but if the anterior part of the area is stimulated movements of the contralateral limbs occur, due to spread of the stimulus to the area 5 a. Sometimes sensory effects are also produced, and they resemble those obtained by stimulation of the area 5 a. In one case removal of a cyst from this area produced in the patient a feeling that she was turning to the opposite side and falling from the operating table. In another patient attacks of the 5 b–5 a type were preceded by vertigo and faradic stimulation of the interparietal fissure at operation produced a similar feeling. From these and other cases Prof. Foerster thinks that the interparietal area may be the cortical area in which the vestibular pathways end.

Areas 7 b and 7 a.—These areas comprise the inferior parietal lobe. Prof. Foerster has never observed any sensory effect from stimulating these areas, not even with the strongest faradic current. No disturbance of sensibility has been observed after excision of these areas. With very strong faradic currents rotation of the head and eyes to the opposite side was observed, in a few cases only, when the posterior parts of the area 7 b were stimulated.

Temporal Lobe.

Area 22.—The area 22 occupies the posterior part of the superior temporal convolution and its borders have not yet been fully defined. Stimulation produces adversive movements similar to those obtained from the area 6 a β. Sensory effects may also be obtained in the form of noises and sometimes voices of obscure character. Epileptic fits originating from the area 22 may show an acoustic aura, and in a few cases the fit was produced by a sudden sharp noise. Thus in one boy suffering from the effects of an old birth injury of the area 22 an attack could be provoked with experimental promptness by letting an object fall on the floor, or by the noise of a passing tramcar.

Specific Functions of the Motor Area.

Summarising the effects obtained from the different motor areas it is seen that they may be divided into pyramidal and extrapyramidal areas. Isolated effects can be obtained from stimulation of the areas 6 a α, 4, and 3, 1, 2; they depend on the integrity of the area 4 and its motor pathway the pyramidal tract. Thus the area 4, the area pyramidalis, is the specific area for isolated innervations. All the other areas, 6 a β, 5 a, 5 b, 22, and, when the area 4 or the pyramidal tract is destroyed, the areas 6 a α and 3, 1, 2, react with complex movements of rotation of the eyes, head, and trunk to the opposite side, and of flexion or extension of the contralateral limbs. These are the extrapyramidal areas. Both groups coöperate when voluntary movements are performed. If the area 4 or the pyramidal tract is destroyed isolated movements can no longer be performed but voluntary movement is by no means completely abolished. Complex flexor or extensor movements of the affected limbs can still be performed, but the movements are combined; this is even more evident when both pyramidal tracts are destroyed. Thus, in spastic tetraplegia all four extremities move together, whichever one of them is moved voluntarily. This reveals the specific function of the extrapyramidal areas. The pyramidal tract takes an uninterrupted course from the cortex to the anterior horn cells of the spinal cord. It is a fast-train connexion between the cortex and the cord. All the other motor pathways, originating in the extrapyramidal cortical areas are interrupted by relay stations in a number of subcortical centres before they reach the anterior horn cells. They are slow-train connexions between the cortex and the cord.

Occipital Lobe.

Area 17.—This is the area striata. In monkeys Sherrington obtained movement of the eyes to the opposite side, but in man stimulation produces no motor effects. The area reacts with optic sensations. When the occipital pole or the posterior part of the area striata on the medial surface is stimulated, the patient sees a stationary light or stars immediately in front of him. When the anterior part of the area is stimulated the light is seen in the peripheral parts of the visual field and is moving towards the centre of the field. If the superior lip of the calcarine fissure is stimulated the light comes from below; when the inferior lip is stimulated it comes from above.

Area 18.—This, the area occipitalis, lies on the lateral surface of the occipital lobe immediately in front of the area 17 and it extends to the medial surface of the hemisphere where it lies both above and below the area 17. Faradic stimulation of this area also produces optic sensations.

Area 19.—The preoccipital area occupies the rest of the occipital cortex and it lies chiefly on the convex surface of the hemisphere. Faradic stimulation produces sensory and motor effects. The sensory effects are optic phenomena of a rather complex character: the patient not only sees a light, stars, or colours, but also figures, people, animals, and so forth. The motor effect consists of movements of the eyes to the opposite side. These results conform with clinical and operative observations of patients suffering from lesions of this area. A number of interesting observations were described, and Prof. Foerster concluded by citing evidence in favour of bilateral representation of the macula.

HARROW MOTHERS' HOSTEL.—In the year 1930–31 there were 122 admissions and as many deliveries. The total weekly cost per patient was £5 14*s.*, and the average weekly payment by patients was £2 19*s.*

SUSSEX PROVIDENT SCHEME.—This organisation for hospital and specialised medical services continues to increase its scope. During the first six months of the current year £8468 was paid to the coöperating institutions, of which the Royal Sussex County Hospital received £3200, and the Royal Alexandra Hospital for Sick Children £1057. The sum of £323 was paid to the Brighton Corporation; and £325 was refunded to subscribers for treatment at non-coöperating hospitals, &c. In the ten years the scheme has been in operation no less than £81,493 has been distributed to hospitals and kindred institutions.

CASUALTIES AND STATISTICS OF THE WAR.

THE OFFICIAL HISTORY.

THE last volume of the "Official History of the War"[1] is unique in that Great Britain is the only country that has published statistics dealing with total casualties from front lines to base. The volume records over 11,000,000 casualties sustained by the British forces at home and overseas. Despite the unavoidable omissions, the wastage which it represents proclaims the cost of modern warfare. The hardship and sacrifice behind the figures can find no place in the analysis, but have nevertheless inspired it in the hope of furthering research to alleviate suffering and prevent disease. The work is largely due to the determination of the late Sir William Leishman that the lessons to be learned from this wealth of material should be made available for all time.

The first chapter relates the vicissitudes through which the book passed in preparation, and the difficulties of striking a balance between theoretical perfection and economy. By focusing attention on the difficulties of building up an organisation to compile statistics, it may help in the evolution of a simpler method for the future. The peace-time system soon proved quite inadequate as the forces increased and patients were rapidly transferred. In 1917 the War Office took over the cost of routine statistical work and instituted the official medical history cards, which were collected by the Medical Research Council to be used later as data for statistics. Unfortunately, even this scheme miscarried, and mistakes were made on all sides, so that in the end the only cards which were of any value were those from the British Expeditionary Force in France. By May, 1919, little progress had been made in obtaining statistics that would be helpful for general and Army medical purposes, although a great deal had been done in compiling and filing twenty odd million individual records. An additional staff was therefore appointed, and when the register of index cards was complete—in 1921—it was decided to examine two sample sets, each of about 500,000 cards, to form the basis of a statistical volume. Finally, it was decided that the book must be limited to the outstanding problems of casualties, man-power and wastage, and to tabulating and publishing the type of information which was regularly called for or constantly used during the war by staff, administrative, and medical officers.

The Magnitude of the Casualty Problem.

Casualties are classified and analysed according to their area, and non-battle casualties and the chief causes of inefficiency among the troops are discussed, while the concluding chapter records the work of the Ministry of Pensions since its inception. The after-effects of the war are strikingly illustrated by the fact that—exclusive of Dominion and other overseas forces—2,414,000 individuals, or 40 per cent. of those who served, were affected by war service in the sense of death or some disablement for which compensation was given.

"If," the authors conclude, "these figures are remembered when preparations are being made, then questions relating to the supply of additional personnel, equipment and transport for the medical services will have a greater interest for all branches of the Army, and they will be considered not only as a means of succouring sick and wounded, but as important factors in preventing wastage, conserving the man-power of the nation during hostilities, and reducing expenditure after the war."

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[1] Casualties and Medical Statistics of the Great War. By Major T. J. Mitchell and Miss G. M. Smith. H.M. Stationery Office. 1931. Pp. 382. £1 1*s.*

The authors feel that the magnitude of the problem is scarcely realised, rarely studied, and seldom fully appreciated. As Sir William Robertson remarked, "The longer peace continues, the more difficult it is to prepare for war," and the medical services, like other services, lack the experience in handling and providing for large masses of men. The expansion of the forces in the war was without parallel, and the organisation had to be very different from that of peace. In August, 1914, the Royal Army Medical Corps numbered 1279 officers and 3811 other ranks, while in August, 1918, it numbered 10,178 officers and 100,176 other ranks, exclusive of Territorial forces. Moreover, 637,746 hospital beds were equipped and maintained. Another essential basis of calculation is the probable number of sick, dead, invalids, evacuations, and men returned to duty. Knowledge of local conditions in foreign countries will prevent "misfits" in sending unsuitable troops or equipment to foreign areas. Moreover, Eastern races may be added to the Army as troops for multifarious auxiliary duties, and failure to study their races, customs, and diets may involve serious casualties. Our labour battalions in France in 1917 and 1918 were composed of 117,848 Indians, Egyptians, South Africans, Fijians, and Chinese, for whom special hospitals, special diet, and special treatment had to be arranged. The native followers of the East African Expeditionary Force numbered nearly three times as many as the troops, and it was found that much disease might have been avoided if men from low-lying districts had been sent to low-lying country, and those from the highlands to hilly areas.

BATTLE CASUALTIES.

Where the figures are complete, they show that, of the sick and wounded admitted to medical units, 3·04 per cent. died, 58·10 per cent. were returned to duty, and 37·41 per cent. were evacuated overseas. In all theatres the percentage of deaths from disease or injury was lower than in the South African War, despite the much greater destructiveness of modern armaments; 55 per cent. of the deaths from wounds and 32 per cent. of those from disease or injury occurred in casualty clearing-stations and other front-line medical units. About 82 per cent. of wounded and 93 per cent. of sick or injured were returned to some form of duty.

The authors stress the futility of supplying the Army with the finest doctors, nurses, and material available unless casualties can be systematically collected, rapidly evacuated, and suitably accommodated, and urge the vital importance of coöperation between the medical services, the army commander, and the forces in the field. Our armies were insufficiently supplied with stretcher-bearers at the beginning, but gradually learned that it was worth while to supply enough men, and fit men, for this work, and to arrange very carefully the programmes, allotments, and time-tables for transport.

The fact that 1,140,398 wounded were admitted to casualty clearing-stations in France during 1917 and 1918 gives some idea of the work done by these units. Of the total number, 30 per cent. required and received immediate operation. Since 55 per cent. of the total deaths from wounds occurred in casualty clearing-stations, it is obvious that high medical and surgical skill should be available in them.

The authors discuss transport, mentioning the useful ambulance transport steamer or barge for river work; during the war 3,443,507 sick and wounded were evacuated from the front to the base in France by ambulance train or improvised ambulance train. Of the total sick and wounded admitted to casualty clearing-stations, 75 per cent. of the sick, 90 per cent. of the wounded, and 81 per cent. of the total sick and wounded required evacuation to the base, and transport accommodation had to be provided for 58 per cent. sitting cases and 42 per cent. lying-down cases. The authors think that the provision of vacant beds in base hospitals should be not less than 33 per cent. of the equipped beds; during the war the percentage was generally below this figure. Obviously such a task must involve forethought, organisation, and—above all—liaison between staff and medical officer. At the beginning of the war the text-book methods of evacuation broke down, but fortunately in France the service was soon restored. The early and systematic collection and evacuation of all casualties is a primary principle of the conservation of man-power.

Useful and interesting tables in this chapter show the percentages of wounds caused by different weapons, the regional incidence of wounds, and the percentage of casualties suffered by the various arms of the service.

In 1917, 30 per cent. of the sick and 20 per cent. of the wounded were admitted to convalescent depôts at the base; these units are invaluable during epidemics, for slight casualties, and to give exhausted men a period of recreation and hardening.

"The outstanding lesson of the war in this respect," the chapter concludes, "centres round the advisability of sending 1 or 2 per cent. of the hospital accommodation and 0·5 per cent. of the convalescent depôt accommodation with the advance troops."

NON-BATTLE CASUALTIES.

It is a platitude to medical men that the losses occasioned by the enemy are equalled and often surpassed by the silent intangible enemy of disease. In the war of 1914-1918, the invisible enemy claimed two casualties for every one inflicted by weapons of war. Of the non-battle casualties, excluding those of East Africa during 1914 and 1915, 1·83 per cent. died, and the daily percentage of strength reporting sick varied between 0·05 in the United Kingdom and 0·72 in East Africa. An interesting table shows the principal causes of admission to hospital, with the ratio per 1000 of ration strength, compared with figures from the South African War. As the chapter points out, the best method of enlisting the interest and coöperation of all ranks towards further progress in eliminating disease is to show plainly the wastage that it causes. The tables in this chapter deal with ordinary infectious diseases, Eastern infections, tuberculosis, pneumonia, venereal diseases, malaria, dysentery, influenza, frost-bite, trench-foot, war nephritis, and jaundice.

The succeeding chapters discuss the casualties according to their area: the United Kingdom, France and Flanders, Italy, Macedonia, the Dardanelles, Egypt and Palestine, North Russia, East Africa and South-West Africa, with a final chapter on the South African War for comparison, and another which analyses the million odd British casualties admitted to medical units between 1916 and 1920.

The Work of the Ministry of Pensions.

The last chapter aims to give a broad presentation of the Ministry's medical tasks and accomplishments, with a general analysis of the outstanding medical characteristics of post-war disablement. The Ministry was faced with the task of providing treatment as well as boards; artificial limbs, plastic surgery, mental and psychological treatment, sanatoriums, training for the blind, homes for the paralysed, and vocational training for the disabled were all demanded. The total British officers, nursing sisters, and other ranks, excluding Dominions and other overseas troops, who served during the war was approximately 6,000,000; at the time of the Armistice some 12·5 per cent. of these were dead, and some 10 per cent. had been discharged as disabled. By March 31st, 1930, the disablement total had increased to 27·7 per cent., or a figure of 1,664,000. The chapter discusses the various disablements for which compensation has been paid, and their stablilisation. Diseases of the heart, lungs, and brain remain at the present day the most conspicuous items in the State's liability, while the wounds, despite their greater number, have mostly healed. In the first awards made in 1920–21, wounds, malaria, and functional diseases of the heart headed the list, while as time went on tuberculosis, respiratory diseases, organic diseases of the heart, and psychoses relatively increased. Ear diseases, rheumatism, and dysentery remained remarkably even in proportion. Stabilisation was possible at an early date for wounds, amputations, malaria, neurasthenia, and functional diseases of the heart. Assessments in the 70 to 100 per cent. group are principally made up of tuberculosis and psychosis, while the "30 per cent. and under" category is largely made up of malaria, neurasthenia, rheumatism, and functional diseases of the heart. There are still approximately 113,000 pensioners whose disability has such an uncertain prognosis that the compensation cannot be stabilised. "General surgical" disabilities tend to increase in proportion towards the end of the period under review, thus showing the importance of surgical conditions as a continuing cause of institutional care.

It is impossible to do more than indicate some of the outstanding points in this extraordinarily informing and important volume; it must be consulted by all those who have any concern with the welfare of armies, and will be of great interest to all medical men.

BUDAPEST.

(FROM OUR OWN CORRESPONDENT.)

ABORTION AND BIRTH-RATE.

THE number of abortions in Hungary have more than doubled in the last 20 years; at the same time the birth-rate has fallen from 40·5 to 24·7 per 1000. The number of abortions amount to between 110,000 and 120,000 every year, and of these 70 per cent. are criminal abortions. The cause of this state of affairs is attributed to the lax standards of doctors as to indications for induced abortion. According to Hungarian law, pregnancy may be interrupted only if the life of the mother is earnestly menaced by pregnancy as such. The actual text of the law does not recognise even this indication, although legal practice has countenanced it. According to prominent Hungarian gynæcologists, the law should be revised and re-worded. In a recent lecture, Dr. Fekete, lecturer to the University of Budapest, discussed in what way the induction of abortions by qualified doctors should be regulated so as to spare the doctor from having to make difficult decisions when approached by patients. It is generally held here that to allow artificial abortion without restriction would be equivalent to national suicide. In Soviet Russia artificial abortion was declared permissible in 1920, but only in institutions, and this has not proved an ideal method of dealing with the problem. The public is not wholly aware of the dangers of abortion; the mortality amounts to 1·2–3 per cent., and morbidity follows in 14 per cent. of the cases, even if the operation is performed in well-equipped, modern operating theatres. In Hungary more than 1200 women succumb to artificial abortion every year, and 6000 to 8000 women have ill-health following the operation. Dr. Fekete pleads that the loss of population due to abortion ought at least to be compensated for by the increased care and protection given to mothers and infants. In the country the proportion of maternity beds to births is 990 to 200,000. In some places the ambulance has to carry a woman in labour a distance of 35 to 70 miles. The Hungarian system of children and infant protection is a very fine one, but it ought to be extended not only to the indigent, but also to families with small incomes.

THE BUDAPEST BRAIN RESEARCH INSTITUTE.

The Budapest Brain Research Institute was founded 20 years ago by Prof. Schaffer, who still directs its activities. Two years ago he was awarded the Ramon y Cajal international prize, and now, on the twentieth anniversary of the foundation of his institute, he has collected the more recent research work emanating therefrom into a substantial volume, dedicated to Prof. Ramon y Cajal. During the past year workers at this institute have published 143 original papers, most of which have appeared also in the German "Hirnpathologische Beiträge." Considering the critical financial conditions now prevailing in Hungary, the maintenance of such an institute is a great sacrifice on the part of the State, but owing to the high reputation of the institute, the Government is ready to continue to support it.

THE PORGES-POLLATSCHEK TEST OF PREGNANCY.

At the recent meeting of the Royal Medical Society Dr. Göczy read a paper on his experience with this test on 50 pregnant and 50 non-pregnant women. The basis of the test is a skin reaction, the skin of pregnant women being said to be less sensitive to the injection of prolan than that of non-pregnant women. The injection of 0·2 c.cm. prolan intracutaneously in women causes a bright pink reaction 2 to 3 c.cm. in diameter; this conspicuous reaction is said to be entirely absent when the woman is pregnant. Göczy has experimented also with glanduantin and præhormon, both of which hormones correspond to the prolan of Zondek, with the difference that 1 c.cm. of prolan contains 100-rat units, while an equivalent amount of the other substances contains only 30 units. The test was a failure in 15 of the 50 pregnant women and in 22 of the control cases. Similar results were obtained by other Hungarian investigators, who have arrived at the conclusion that the test is valid neither for the confirmation or for the exclusion of pregnancy.

THE VISION OF MOTOR-CAR DRIVERS.

The Hungarian Government is elaborating new rules for road traffic with a view to decreasing the number of accidents, which have recently increased in number to an alarming extent. The general health examination of drivers will also be revised and new requirements will be set up. In this connexion

Prof. Grosz has observed that the standards of sight demanded vary in different countries. Some authorities hold the view that *non-professional* drivers need not be examined at all. According to Prof. Grosz, the accidents which can be brought into definite causal reaction with the bodily defects of drivers amount only to 1·5 per cent. of all accidents. The number of non-professional drivers in all countries is now very high; in France it is estimated at about 1,000,000, in Belgium as 140,000. The physical examination of such large numbers of people would give rise to great difficulties. Perhaps it is for this reason that the United States, Great Britain, and France do not conduct physical examination on all drivers. This attitude is strengthened by the experiences of the insurance companies, which indicate that accidents caused by the physical defects of drivers are very rare. Even in those countries where tests for physical fitness are held, such as Germany, Denmark, Italy, Norway, and Switzerland, persons with only one eye are allowed to drive cars. In Hungary, at the present time, a higher standard of vision is required from professional than from non-professional drivers.

PROF. ERWIN TÖRÖK.

On the invitation of the central committee of the Hungarian post-graduate medical courses, Prof. Erwin Török, who now teaches ophthalmology at the New York Policlinic Medical School and Hospital, delivered some lectures here in June. Prof. Török is a Hungarian by birth; from 1899 to 1906 he acted as assistant at the clinic of Prof. Emile Grosz, who presided on the occasion of his lecture on Syphilis and Trauma, and welcomed him to Budapest.

MEDICINE AND THE LAW.

Accommodation in Mental Hospitals.

RECENT proceedings in the Chancery Division may focus public attention on the difficulty of housing what used to be called "pauper lunatics," now more happily named by statute "rate-aided patients of unsound mind." According to the Board of Control's annual report for 1929, experience shows that when there is a shortage of accommodation the admissions fall; they rise immediately additional accommodation is provided. That report described the position as "very serious" except that visiting committees as a whole were found to be increasingly aware of the need for additional accommodation to meet immediate and future requirements. More recent information, contained in a Board of Control circular issued last May, was quoted in the recent Chancery proceedings. The overcrowding as at Jan. 1st last was stated to amount to 452 beds on the male side and 1635 beds on the female side; there were only 27 hospitals with 10 or more vacant beds on the male side and only 10 hospitals with similar vacancies on the female side. The circular warned local authorities that they could no longer hope to avoid overcrowding by resort to contract accommodation. Contract arrangements were useful as a temporary measure but should not be adopted if, as frequent complaints indicated, it involved sending patients so far from their homes as to make visiting prohibitively expensive.

The case in the Chancery Division concerned the patients from East Ham which, until its incorporation in 1913, was part of Essex for lunacy purposes and sent its patients to the county institutions. In July, 1929, East Ham made an agreement with the committee of visitors of the county of Essex and borough of Colchester mental hospitals for the reception of its patients. The agreement was to remain in force (unless earlier determined by the Minister of Health) until June 24th, 1930, as from which date the East Ham corporation undertook to remove all its patients to a hospital which it would itself provide. At one time, it appears, the patients concerned under the agreement numbered 200, but 108 had been moved in the past two years. Essex and Colchester complained that East Ham had failed to carry out its undertaking; they asked Mr. Justice Eve to order specific performance of the agreement to remove the patients. East Ham admitted that it had no defence. There was a scheme on foot, provisionally sanctioned by the Board of Control, for joining with Southend in the provision of an institution. The Board, it was said, had refused to allow East Ham to provide a separate institution of its own. East Ham submitted to an order of the Court admitting the duty to remove the patients and undertaking to press on the joint scheme with Southend (see p. 330), paying meanwhile contract rates previously in force. Essex and Colchester are to have liberty to apply for a mandatory injunction if, before Jan. 17th, 1932, East Ham has not removed 25 of its patients. The rate of removal is to be 25 patients every six months, so that there should be a complete clearance in three years—the period likely to be wanted for providing the proposed joint mental hospital for which special premises and an adequately trained staff will, of course, be required. The high proportion of female patients to male patients is an added difficulty; to meet this the order directs that each batch of 25 patients removed shall consist of 20 females and five males.

The Eyesight Standard for Motorists.

The Master of the Rolls has hinted that the Minister of Transport might revise the eyesight qualification for motorists. He was delivering judgment in the Court of Appeal in proceedings arising out of the refusal of the Cumberland county council to renew a motor-car driving licence in what was evidently rather a hard case. Every applicant for a licence has to make a declaration of physical fitness. The declaration involves, amongst other things, answering a question whether the applicant can read at 25 yards in good daylight (with glasses if worn) a motor-car number-plate containing six letters and figures. The applicant frankly admitted that the letters and figures seemed blurred to him, but he could claim that he had driven for eight years without an accident, and he gave a list of various long journeys which he had made by road. He could see persons or animals on the road two or three hundred yards off and cars at a much greater distance. His statement, said Lord Hanworth, showed that he was a capital driver and a driver of experience. "It is impossible to avoid regretting that the question in the form is put in the terms stated, because it would seem that a driver of skill and care is unable to answer in the affirmative a test made for the purpose of driving but which may be ill-suited for the purpose of securing capacity and fitness to drive."

The difficulty arises over Section 5 of the Road Traffic Act as elaborated by the Motor Vehicles (Driving Licences) Regulations made last November. The declaration of physical fitness (prescribed by the Regulations) contains questions as to epilepsy, sudden attacks of disabling giddiness or faintness, and the loss of either hand or foot, in addition to the eyesight question already mentioned. The form also includes a general declaration that the applicant does not suffer from any other disease or disability which would make him a danger as a driver. When this form has been filled up and signed, the next step depends on Subsection (2) of Section 5. Certain diseases or disabilities having thus been specified on the declaration form, "if from the declaration it appears that the applicant is suffering from any such disease or disability as aforesaid, the licensing authority shall refuse to grant the licence." To these uncompromising words several provisos are attached. One relates to invalid carriages, another to existing motorists, a third proviso gives the refused applicant a right to claim a test. But he can only claim a test where there are no such diseases or disabilities as are prescribed; the prescribed diseases and disabilities here are epilepsy, liability to sudden giddiness or fainting, and inability to read letters and figures as on a car number-plate at 25 yards in good daylight, with glasses if worn. It follows that the eyesight disability is final; if it exists, the licensing authority cannot grant a licence. Subsection (5) gives a right of appeal to a court of summary jurisdiction to "any person who is aggrieved by the refusal of a licensing authority to grant a licence." But the Court of Appeal says this does not mean that a person who is refused a licence on account of the eyesight disqualification can appeal to a court of summary jurisdiction. "It is impossible to hold that he is a person aggrieved by the refusal to grant him a licence when the licensing authority has no alternative but to refuse." The case therefore goes back to the justices in Cumberland with an intimation that they have no power to interfere; the decision of the licensing authority (refusing the licence) must stand. The Master of the Rolls nevertheless observes that the Minister of Transport, who prescribes the questions on the form of declaration of physical fitness, might well "consider whether this question is framed so as to embrace cases where defective eyesight ought to be a ground for refusing a licence to drive a motor-car, and whether it does not—as it stands—cause experienced motor-drivers to be excluded from driving when, if the question was in somewhat different terms, they would be able to satisfy all requirements as to capacity to drive a motor-car." Meanwhile, as Lord Justice Slesser remarked, there is nothing to stop the applicant trying again if he can get glasses which will fit him to read the letters and figures at 25 yards.

Deafness as a Driver's Disability.

Another recent case under the Road Traffic Act turned on the possible disability of deafness. The proceedings were under that part of the Act which relates to the driving of "public service vehicles." The Road Traffic Commissioners had refused a man a licence on the ground of occasional deafness; the magistrate's court at Birmingham allowed his appeal subject to conditions that he should always have a conductor on his vehicle and that he should wear an instrument to aid his hearing. The applicant said he was deaf only when in a quiet room; when in a motor-car, with the vibration of the engine and the noise of the traffic, he could hear perfectly. He could hear passengers speaking to him. Dr. J. S. Crabbe said that the applicant suffered from catarrhal deafness, which meant that he had extreme difficulty in hearing in a quiet room but no difficulty where there was vibration or noise.

BATH ROYAL UNITED HOSPITAL APPEAL.—It is announced that the sum of £100,000 appealed for in order to build the new hospital in Combe Park has now been raised.

DRUGS, SURGICAL INSTRUMENTS, APPLIANCES, AND FOODS.

B.M.A. EXHIBITION AT EASTBOURNE.

(Concluded from p. 266.)

Surgical Instruments and Appliances and Clinical Apparatus.

[9] Adair, Dutt and Co., Ltd. (Mortimer House, 37–41, Mortimer-street, W. 1), representing B. Braun, of Melsungen, showed an improved model Sphygmomanometer in a dark oak case; a Hydrostatic Dilating Set which supersedes the de Ribes' bag, using sterile pig- or sheep-bladders filled with glycerin; and sterile catgut Kuhn, claimed to be an absolutely sterile ligature material of standardised absorption-time and greater tensile strength than other catgut of similar thickness.—[60] Allen and Hanburys, Ltd. (48, Wigmore-street, W. 1), showed their latest model of the St. Bartholomew's Hospital Operating Table, with a new patent self-locking device for the Trendelenburg position and an improved head-flap, designed by Mr. T. P. Dunhill, for goitre operations; the "A. and H." Patent Knife with detachable blades and stainless steel handle; Souttar's latest improved Craniotome; a new Adenoid Plane with removable blades, designed by Mr. O. Popper; the Gastrophotor, an intra-gastric camera [1]; Kirschner's Wire Fracture Extension Apparatus and Mr. Max Page's modified pattern; Chevalier Jackson's Œsophagoscopy and Bronchoscopy instruments; Bayeux's Subcutaneous Oxygen Injection Apparatus; the Suda Bath and Chair for colonic lavage; the London Hospital Chorda Catgut, in which the iodine used is controlled to prevent any reduction of tensile strength, and the London Hospital Ligatures and Sutures.—[42] Antiphlogistine was once more shown as the best-known method for the continuous application of moist heat.—[63] Arnold and Sons (in association with Savory and Moore, Ltd., and John Bell and Croyden, 50–52, Wigmore-street, W. 1) showed the latest model of the Arnold Operation Table, with improved movement for the Trendelenburg position, an instrument-table in stainless steel, a new transformer for heating cautery burners which can be used off any supply, direct or alternating, at any voltage, and is absolutely earth-free; Mr. Frank Harvey's improved Sigmoidoscope and Rectal Speculum [2]; and a complete range of Marylebone sutures and ligatures.—[3] The British Hanovia Quartz Lamp Co. (Slough, Bucks) showed, among their light and heat lamps and accessories, the Duo-therapy unit, embodying in one apparatus the Alpine sun lamp and a Sollux heat lamp; a new combination unit incorporating the super-Kromayer and the standard Alpine sun lamps, and an oto-rhino-laryngological water-cooled lamp which, unlike the Kromayer, can be used in any position and is light to handle.—[35] Campoirette, Ltd. (252, Regent-street, W. 1), showed Camp surgical supports, particularly the patent adjustment on their surgical belt which gives a very light adaptable rigid support.—[8] Cameron's Surgical Specialities, Ltd. (57c, New Cavendish-street, W. 1), gave demonstrations with the Electro-diagnostoset, which is now well known as a complete set of electrically lighted investigation instruments; and the Cauterodyne, a radio-frequency cautery scalpel.—[24] Stanley Cox, Ltd. (39, Gerrard-street, W. 1), showed an efficient and portable Autogram X ray apparatus, which automatically calculates and measures the necessary exposure; and a portable diathermy apparatus weighing only 38 pounds.—[18] H. E. Curtis and Son, Ltd. (7, Mandeville-place, W. 1), demonstrated an entirely new corset-belt, En Mains Croisées, supporting the abdominal wall by three pairs of interlacing elastic straps set obliquely at the front.—[19] C. W. Dixey

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[1] See THE LANCET, July 25th, 1931, pp. 174 and 177.

[2] THE LANCET, 1931, i., 1033.

and Son, Ltd. (19, Old Bond-street, and 20, Welbeck-street, W.1), amidst a wide range of ophthalmic apparatus, drew attention to their cases of test lenses; the Maddox, cheiroscope for training children with squint; and the Mackie slit lamp, introduced to provide an efficient, simple, sturdy instrument at moderate cost.—[65] Down Bros., Ltd. (21–23, St. Thomas's-street, S.E. 1), had a full display of surgical instruments, including Howarth's improved Chevalier Jackson's bronchoscopy and œsophagoscopy instruments with recent lens improvements; a complete selection of Meurice Sinclair's operative instruments for fractures, and new fracture instruments by Mr. Souttar; ox-bone plates and spoons by Hamilton Bailey; the up-to-date Quadrant model operation table with several important recent modifications, including an oil-pressure pump, and diathermy cautery knives and endotherms.—[25] The Dowsing Radiant Heat Co., Ltd. (91–93, Baker-street, W. 1) announced that their well-known heating apparatus can now be purchased outright or hired for long periods, and also showed the Dexter home washing machine, which uses only a quarter of a unit an hour.—[20] Fassett and Johnson, Ltd. (86, Clerkenwell-road, E.C.), together with their usual range of adhesive plasters, drew special attention to the new Ready-aid, combining a sterilised gauze pad, medicated with boric acid, attached to a strip of flesh-coloured adhesive plaster, ventilated to allow filtered air to reach the wound.—[13] The Genito-Urinary Manufacturing Co. (28A, Devonshire-street, W. 1), the sole agents for J. Eynard et Cie, Paris, and for Stilles, Stockholm, showed, among many instruments, new laryngoscopes, bronchoscopes and œsophagoscopes by V. E. Negus; empyema drainage-tubes by A. Tudor Edwards; Kidd's new model automatic boomerang stitcher; the diathermy knife, and radium instruments.—[1] The Holborn Surgical Instrument Co., Ltd. (26, Thavies Inn, E.C. 1), emphasised the advantages of their new twin-pump operation table fitted with a pedal whereby the surgeon can produce the Trendelenburg position without using his hands; Stutzer's patent surgeon's stool, on which the surgeon sits in a comfortable saddle and can tilt himself forward by a foot lever; the Brilite tongue spatula, with a lamp in the handle, reflecting light along the specially polished glass tongue-depressor; the Protector uterine forceps, which seize the cervix without lacerating it, and which can be hooked into the Schonenberg self-retaining speculum; and an improved form of Simpson's lithotomy straps in the form of canvas boots so that the legs are not cut.—[29] Johnson and Johnson (Great Britain), Ltd. (Slough, Bucks) displayed a range of ligatures, sutures and other appliances, including the well-known "K. Y." jelly; the Tek toothbrush, with a small head to get inside the dental arch; and Johnson's baby products. [49 and 61] Mayer and Phelps (59–61, New Cavendish-street, W.1) had a large selection of instruments and appliances on view, including the M.P. clinical lamp designed for the obstetric wing of University College Hospital—a useful lamp for general examinations; Lambert Roger's skull plough with electric motor; Prof. D. Dougal's new model for teaching obstetrics to a class—a porcelain sink with basin shaped like the posterior half of the uterus; and an improved breast pump in which the milk is drawn through a wide aperture into the bottle, which is boilable.—[23] Rayner and Keeler, Ltd. (100, New Bond-street, W. 1), among their display of ophthalmic instruments, drew attention to their full range of retinoscopes and ophthalmoscopes; the Edridge-Green colour perception lantern and bead-box test; the internally illuminated drum test type, and a luminous object perimeter-scotometer. [14] A halometer and a tonsil suction apparatus by Dr. F. C. Eve, and an inhaler for open ether administration by W. Stanley Sykes.—[52] Short and Mason, Ltd. (Aneroid Works, Walthamstow, E. 17), in addition to the familiar Tycos sphygmomanometers and thermometers, showed the Tycos venostat for blood shunting—throwing a substantial part of the blood out of the general circulation—in heart failure and cardiac asthma; the Tycos dermatherm, for accurate measurement of surface temperatures, and apparatus for tubal insufflation.—[40 and 41] T. J. Smith and Nephew, Ltd. (42, Tavistock-square, W.C. 1), presented Elastoplast, an elastic adhesive strapping which is already a favourite treatment for varicose ulcers and veins, and many sprains and other injuries; and also Cellona, an entirely new plaster-of-Paris bandage which is light and clean, somewhat elastic and easily cut, and which can be completely moistened in plain water in a few seconds.—[80] Edward Taylor, Ltd. (Salford, Lancs), showed their range of adhesive and medicated plasters, including Flexoplast, a self-adhesive antiseptic elastic bandage; Emergoplast, a simple dressing for immediate application to minor injuries, which is supplied with various medications, with and without perforation, full spread or part spread; and zinc oxide plaster spread on white wool felt of three different textures.

Books.

[12] Baillière, Tindall and Cox (7 and 8, Henrietta-street, Covent Garden, W.C. 2) were showing "Quantitative Clinical Chemistry," by J. P. Peters and D. D. Van Slyke; "Bioassays," by J. C. Munch; "Annals of the Pickett-Thomson Research Laboratory," Volume VII.; "Leonardo Da Vinci," by J. P. McMurrich, and some new volumes in the Students' Aids Series.—[39] J. and A. Churchill, Ltd. (40, Gloucester-place, W. 1), drew attention to Bowlby and Andrewes' "Surgical Pathology and Morbid Anatomy," revised by Geoffrey Keynes; Rogers and Megaw's "Tropical Medicine"; Romanis and Mitchiner's "Surgical Emergencies"; Osgood and Haskins' "Text-book of Laboratory Diagnosis"; and to a number of new volumes in the "Recent Advances" series, which now numbers 28, notably Gray's "Allergy," Beaumont's "Medicine," now in its sixth edition, Findlay's "Chemotherapy" and Imms's "Entomology."—[6] Constable and Co., Ltd. (10 and 12, Orange-street, W.C. 2), had on their stand "The Practical Treatment of Diabetes," by T. Izod Bennett; "The Metabolism of Tumours," by Otto Warburg; "The Social Control of the Mentally Deficient," by Stanley Powell Davies; and "The Modern Medical Monographs" series.—[21A] The Food Education Society (29, Gordon-square, W.C.1) displayed a number of books and pamphlets on diet and domestic subjects, including "Children's Diet," by Charles Hecht; "Vegetables: Their Use, Abuse and Neglect"; "Life without Servants," by Harold Begbie, and "The Truth about Fat."—[43] H. K. Lewis and Co., Ltd. (136 and 140, Gower-street, W.C. 1), pointed out "Diseases of the Tongue," by W. G. Spencer and Stanford Cade; "The Physical and Radiological Examination of the Lungs," by James Crocket; "The Alcohol Habit and its Treatment," by W. E. Masters; "Fundamental Principles of Ray Therapy: An Elementary Text-book for Nurses, Students and Practitioners," by William Beaumont; "A Text-book on the Nursing and Diseases of Sick Children," edited by Alan A. Moncrieff, and also many varieties of *medical stationery*.—[31] The Oxford University Press (Amen House, Warwick-square, E.C.4) selected for special recommendation C. B. Heald's "Injuries and Sport: A General Guide to the Practitioner"; Hurst and Stewart's "Gastric and Duodenal Ulcer"; new editions of Ker's "Infectious Diseases," Still's "Common Disorders and Diseases of Childhood," Wright's "Applied Physiology," and Price's "Text-book of the Practice of Medicine," "Bibliotheca Osleriana," and William Brown's "Science and Personality."

Spas, Hospital Furniture, and Miscellaneous.

[5] Buxton showed photographs of their hot and natural baths and therapeutic establishment, pointing out that a "cure ticket" for a period of three

weeks, covering all treatments prescribed, can be obtained for three guineas.—[32] R. H. Dent (309, Oxford-street, W. 1) showed further developments of his Ardente hearing aids, particularly the new "snug" type of earpiece which fits into the orifice without getting hot; and the new stethoscope for deaf doctors, smaller than the original but more sensitive. Ardente auditorium sets are now installed in many churches.—[21] The Eastbourne Gas Company (87–89, Terminus-road, Eastbourne) showed photographs of practical uses of gas in hospitals; an incinerator; and the Indusa heater for large apartments.—[75] General Acoustics, Ltd. (77, Wigmore-street, W. 1), showed Acousticon aids for the deaf, including electrical and non-electrical apparatus, and the Dime earpiece, which is moulded to the exact shape of the ear.—[27] Harrogate, in drawing attention to its great diversity of spa waters, stressed the mud (Fango) treatment given from a recently discovered bed in the medicinal water-bearing strata, and also the system of training and certification of nursing staff.—[2] Hoskins and Sewell, Ltd. (Bordesley, Birmingham), showed beds, cots and fracture apparatus, particularly the St. Bartholomew's patent wind-up mattress cot, which can be wound up at either end, or the whole mattress can be raised to waist-level for demonstration purposes; the wheeling ward beds have several cunning devices so that a bed can be wheeled in any direction; Hoskite wheels and the Hoskins patent high-pressure lubrication make wardwork simpler, and Goldex and Silvex are pleasing modern metallic finishes for nursing-home or nurses'-home beds.—[71] Kolynos Incorporated (Chenies-street, W.C. 1), presenting their familiar dental cream, drew attention to liquid Kolynos as a mouthwash or spray and Kolynos denture powder for artificial teeth.—[64] The Medical Insurance Agency (B.M.A. House, Tavistock-square, W.C. 1) was represented by officials ready to give advice on all matters of insurance, and reminded visitors of the large grants given by this agency to medical charities every year. An innovation on this stand was the presence of the manager of the B.M.A. (Tavistock-square) branch of the Westminster Bank, who gave information about stocks and shares, wills, trusts, settlements, and other banking matters.—[10] The Medical Sickness, Annuity and Life Assurance Society, Ltd. (300, High Holborn, W.C. 1), had their usual stand to remind visitors that there is an insurance society managed by doctors for doctors.—[16] Pepsodent Co. (8, India-street, E.C. 3) displayed their well-known acid dentifrice.—[38] "The Practitioner" (6–8, Bouverie-street, E.C. 4) was a newcomer to the exhibition; particular attention was invited to the July special number on fractures and accidents.—[26] Thermega, Ltd. (51–53, Victoria-street, S.W. 1), showed electrically heated cushions and blankets and couches, with special reference to a warmed couch-mattress which does much to encourage muscular relaxation.—[50] Whitfields Bedsteads, Ltd. (109 to 125, Watery-lane, Bordesley, Birmingham), invited interest by their Lawson Tait patent cardiac bedstead as designed for Sir Thomas Lewis at University College Hospital; Lawson Tait Barnet maternity bedstead with basinette, as designed for the Wellhouse Hospital, Barnet; and the new Meurice Sinclair's patent portable fracture apparatus for fixing to any bedstead. Also displayed on this stand was the Harco sponge-rubber mattress, a great improvement on the old water-bed or air-bed, with a loose cover made of acid-proof waterproof sheeting which can be removed for sterilisation (Cassell, Andrews and Co., Ltd., Hardman-street, Manchester).

PUBLIC HEALTH SERVICES

REPORTS OF MEDICAL OFFICERS OF HEALTH.

THE following are 1930 statistics of six boroughs:—

Name of district and estimated mid-year population.*	Birth-rate.	Death-rates per 1000 of the population.					Death-rates per 1000 births.		
		All causes.	Tuberculosis.	Cancer.	Respiratory diseases with influenza.	Heart disease.	Infant and neonatal mortality.	Young child (1–5 yr.) mortality.	Maternal mortality in childbirth.
Swindon (62,020) ..	15·7	10·8	0·84	1·56	1·0	2·6	63/43	20	2·1
Cambridge (60,730) ..	12·5	11·2	0·61	1·37	1·4	1·7	40/28	28	5·3
Gillingham (56,670) ..	14·8	11·1	1·00	1·77	1·0	2·6	41/22	—	6·2
Poole (56,150) ..	16·7	12·4	0·96	1·87	1·4	2·2	58/35	20	5·3
Watford (55,870) ..	15·4	9·5	0·84	1·48	0·8	1·9	46/33	—	2·3
Darwen (37,780) ..	11·6	12·5	0·26	1·56	1·7	2·5	70/39	—	6·8

Registered stillbirths per 100 live births: Swindon 4·3, Gillingham, 3·6, Poole 4·0, Darwen, 5·5.

* As a rule the estimate (R.-G.) for 1929 has been used.

Swindon.

Dr. Dunstan Brewer says that, although the year 1930 was a healthy one for the country as a whole, it was not so in Swindon. Infant mortality was high; the general mortality was no better than in recent years, and certain diseases were more prevalent than usual and showed a higher fatality. The chief events of 1930 were the reconstruction of the administrative block at the isolation hospital; the building of an adequate maternity hospital; the opening of a new wing of the Victoria Hospital; and the decision to proceed with a scheme for an additional water-supply from Latton. The higher infant mortality-rate was due to neonatal deaths at one period, the deaths subsequently being low. The mortality-rate among pre-school children was also low, but at the school age the rate was unfavourable. All deaths under 20 were made the subject of inquiry, where the medical history of the person was known to the health department. There were 124 such deaths, and of these 11 were due to congenital defects, 7 to measles, 11 to whooping-cough, 9 to diphtheria, 9 to rheumatic infection, and 24 to prematurity. Dr. Brewer adopts the unusual custom of making epidemiological forecasts, which are printed in the health committee's minutes month by month. These forecasts, some of which prove to be right and some wrong, are founded on a study of the local behaviour of disease and its variations in type and of the position of the disease in other parts of the world. Dr. Brewer is hoping that in the future it may be possible to forecast the behaviour of disease as accurately as that of the weather. There were 100 cases of true diphtheria with the high case-fatality of 9 per cent. Both deaths due to and notifications of non-pulmonary tuberculosis, other than meningitis, were higher than usual. Dr. Brewer believes that the higher notifications are in part due to the notifications of enlarged glands found during abdominal operations. He is not satisfied that we are *getting a grasp* of tuberculosis, and suggests that elaborate registers have confused the issue. He welcomes the latest Tuberculosis Order (1930).

Under the Housing Act programme 500 new houses are to be erected, 50 of which will be allocated to rehousing persons displaced by closing or demolition orders. Housing in Swindon is exceptionally good for an industrial town. The amount of overcrowding is not great but does not diminish. The chief hospital lack is for general medical cases, although the new wing at the Victoria Hospital provides some beds for this purpose.

Cambridge.

Dr. Andrew J. Laird says that inhabited houses number 16,215. The five-year housing programme provides for 260 new houses per annum to be erected by the corporation, of which 60 are to be set aside for tenants selected by the health committee from houses demolished and in need of substantial renovation, and from overcrowded houses, in which the tenants cannot pay the rent of a council house and where there are families of young persons. The applicants for municipal houses at the end of 1930 numbered 1511. Caravan dwellings have increased in number during recent years. They are provided with pail closets and stand on unpaved surfaces. Dr. Laird suggests that it may be necessary to provide special parking places, with all necessary requirements, and to prohibit caravans elsewhere. The scheme of Mr. W. B. Grandison, the public dental officer, for the enrolment of mothers and young children to secure regular attention to their teeth continues to grow. During the year 80 mothers took advantage of the treatment offered during pregnancy, and 380 children under school age, an increase of 66 on the previous year, were enrolled, and will be examined and treated every six months or oftener. Mr. Grandison finds that the regular and frequent application of ammonical solution of nitrate of silver and formalin by Howe's method is particularly efficacious in preventing the progress of dental disease in pre-school children.

Gillingham.

Dr. William A. Muir says the shortage of houses is undoubtedly less acute but that about 6 per cent. are overcrowded, according to the standard of two adults per bedroom. The prospects of demolishing unfit properties are better now than for many years. Gillingham, being a town of recent origin, has no slum areas, and its five-year programme only deals with individual unfit houses. At the last census inhabited houses numbered 10,859, and the requirements for the next five years are set down as 600 houses for the relief of overcrowding, 120 to replace demolished houses, and 800 for increase of population. Overcrowding in most cases is due to the shortage of houses, and not to inability to pay the rents of available houses. It has been found more satisfactory in Gillingham to deal with housing defects under the Public Health Acts rather than under Section 3 of the Housing Act, 1925. A local Bill is being promoted to prohibit tents, vans, sheds, &c., from being placed on any land without the previous approval of the corporation.

The corporation now supervises children boarded out under the Children Act, and at the end of the year there were 24 registered foster-mothers, one of whom was fined for failure to notify that she had received a foster-child. In October the borough took over the supervision of midwives. The appointment of Dr. Meta Dunlop as a full-time assistant has enabled antenatal clinics to be established, which were attended by 75 new cases during the last half of the year. The council has also approved the giving of contraceptive advice in cases where pregnancy would be detrimental to health. To begin with, there will be no regular clinic, but appointments will be made for attendance at special sessions at one of the centres. In the spring of 1930 a nuisance arose, which had only been partially remedied when Dr. Muir's report was written, from a new process adopted by a cement factory, resulting in an increased emission of dust in the neighbourhood.

Poole.

Dr. R. J. Maule Horne's report shows that Poole is growing rapidly. At the 1921 census the houses numbered 9400, and since then 4562 houses have been built. Over three miles of new water-mains were laid during 1930, and the sewer extensions have difficulty in keeping pace with the house building. In 1926 there were 400 cesspools; the figure rose to 781 in 1928, and has decreased in 1930 to 662. This exceptional rate of development is a menace to the pine-clad areas, and Dr. Horne is anxious that no tree be sacrificed unnecessarily. About 30 years ago the first blades of rice grass (*Spartina Townsendii*) were found in the harbour, and now some square miles are covered by it. It is an excellent binder for low-lying foreshore land. Poole is well off for parks and swimming facilities. The cleansing and scavenging systems are being reorganised, and it is intended to adopt the Bradford system of controlled tipping. One of the needs is a model lodging-house, which would cater for the visiting seamen.

The public analyst, Mr. William Partridge, reports that the town is badly served in the matter of butter. Well-made butter contains between 10 per cent. and 13 per cent. of water. Of 15 samples analysed during the year, 13 contained from 14·8 per cent. to 16·0 per cent. of water, and of the other two samples one contained 13·6 per cent. and may have been a dairy butter, while the other contained 14·3 per cent. and might be a factory butter or a badly made dairy butter. A huge traffic is done, says Mr. Partridge, in buying dry butter and incorporating water to the maximum, but there is no power to take action, even if it is known that the butter is weighted with water. The municipality took over the supervision of boarded-out children on April 1st, and there are 63 boarded-out children on the register. A table given by Dr. Horne shows that since 1907 the deaths of pre-school children have declined in number even more than the infant deaths.

Watford.

Dr. William J. Cox's report shows that there were 9944 houses at the census of 1921, and that the borough has conducted an active municipal housing campaign since 1916. The slums are grouped around the High-street. Some of the worst have been demolished. In 1924 the Ministry sanctioned the building of 114 houses on the Wiggenhall estate for slum tenants. All the tenants did not accept the offer, and this enabled 114 houses to serve for 152 demolished during 1924 to 1928. It is intended to deal with 199 houses in clearance areas and one other house during the next five years, and it is hoped to deal with at least 130 during the present year. In addition, 400 houses are to be built to relieve shortage. The Watford Joint Isolation Hospital (66 beds) is inadequate for the population of 100,000 which it serves. Dr. Cox urges strongly that the diphtheria ward, for which plans have been drawn, should be proceeded with at once. Dr. Cox inspects most of the schools in his district on behalf of the county council. He shows that, owing to the tact and energy of the school nurse in following up, nearly all the parents obtained treatment for the defects found in their children, and that there has been a very great improvement in the cleanliness of the children since the early days of medical inspection.

Darwen.

Dr. James Robertson gives cotton-weaving, paper-making, fireclay- and iron-workers as the chief occupations. Trade is depressed, and the population is estimated to have declined by 1000 since the 1921 census. There is no hospital accommodation in the borough for any but infectious diseases. The Queen's Park Hospital, Blackburn, is the public assistance infirmary for Darwen. General medical and surgical cases are admitted to Blackburn Royal Infirmary. The only common lodging-house is a municipal one. Owing to trade depression and the decrease in the number of vagrants, due to the Unemployment Insurance Acts, there was a decline in lodgers of about 12 per cent., and 15 aged and infirm lodgers were admitted to the public assistance institution. The clearance of the Bury-street area is now practically complete, and, apart from this, there are only small groups of scattered houses requiring to be demolished. Dr. Robertson says that the majority of the ground floors of existing houses are flagged, and that the chief trouble is dampness owing to the lack of subsoil drainage. It is estimated that during the next five years 243 houses will be repaired under Part II. of the Housing Act, 1930.

There are 73 cowkeepers on the register, and extensive improvements have been carried out at the dairy farms, at an estimated cost of about £2000. The bed of the River Darwen is held to be a nuisance, owing to the deposit of rubbish. The whole of the bed needs pitching and the portion near dwelling-houses and shops should be culverted.

INFECTIOUS DISEASE

IN ENGLAND AND WALES DURING THE WEEK ENDED JULY 25TH, 1931.

Notifications.—The following cases of infectious disease were notified during the week:—Small-pox, 36 (last week, 50); scarlet fever, 1526; diphtheria, 838; enteric fever, 59; pneumonia, 521; puerperal fever, 43; puerperal pyrexia, 94; cerebro-spinal fever, 30 (last week, 43); acute poliomyelitis, 10; acute polio-encephalitis, 1; encephalitis lethargica, 9; continued fever, 1; dysentery, 7; and ophthalmia neonatorum, 106. No case of cholera, plague, or typhus fever was notified during the week.

The number of cases in the Infectious Hospitals of the London County Council on July 28th–29th was as follows: Small-pox, 58 under treatment, 2 under observation (last week, 62 and 2 respectively); scarlet fever, 1231; diphtheria, 1513; enteric fever, 13; measles, 138; whooping-cough, 396; puerperal fever, 30 (plus 9 babies); encephalitis lethargica, 208; poliomyelitis, 1; "other diseases," 124. At St. Margaret's Hospital there were 10 babies (plus 7 mothers) with ophthalmia neonatorum.

Deaths.—In the aggregate of great towns, including London, there were no deaths from small-pox, 1 (0) from enteric fever, 18 (1) from measles, 2 (0) from scarlet fever, 13 (3) from whooping-cough, 19 (3) from diphtheria, 39 (11) from diarrhœa and enteritis under two years, and 14 (1) from influenza. The figures in parentheses are those for London itself.

Five of the deaths from measles were reported from Barnsley and four from Liverpool. Three fatal cases of diphtheria were notified in Liverpool, which also reported five deaths from diarrhœa and enteritis under two years. Of the other deaths from this cause four were in Sheffield, three in Sunderland, and two in West Hartlepool. Three deaths from meningococcal meningitis were notified in London, one in an infant, and the others in age-groups 15–35.

The number of stillbirths notified during the week was 247 (corresponding to a rate of 36 per 1000 births), including 42 in London.

PANEL AND CONTRACT PRACTICE

POSITION OF NATIONAL HEALTH INSURANCE.

DEBATE IN HOUSE OF COMMONS.

An important debate on sickness certification and other problems of national health insurance took place in the House of Commons on July 29th, arising out of a vote of £13,116,212 for salaries and expenses of the Ministry of Health.

Sir **Kingsley Wood** (formerly Parliamentary Secretary to the Ministry of Health) said he wished to draw attention to certain grave and disturbing aspects of national health insurance, and particularly to the very heavy sickness and disablement experience which had now prevailed for a considerable period. This matter was not only of national importance, but was giving considerable anxiety to the societies themselves and to all who desired to see national insurance maintained on a safe and stable basis. The system had proved of great use and worth to the nation. The total amount paid out in the last year for which they had figures, including the Exchequer contribution from the Ministry of Health Vote, was some £35,000,000, and medical benefit cost some £8,700,000. Of that sum insurance doctors received some £6,256,000, and nearly £2,000,000 was paid to insurance chemists for drugs and appliances. There was paid in sickness benefit some £11,250,000, in disablement benefit some £5,350,000, and in maternity benefit another £1,440,000. The decline in the mortality-rate had been one of the most satisfactory features of the century. Medical science had progressed a long way in recent years; many diseases had been successfully grappled with, and a very great deal had been attained by medical research. Yet in spite of this there had been a marked and striking increase in claims of insured persons for sickness and disablement benefits and in the consequent expenditure on those benefits. This process had been going on since 1925, and while there was some improvement in 1928, as compared with the high rate of 1927, this improvement was not maintained. Last year there was some improvement, though not a very considerable one, but in 1929 there was a serious epidemic of influenza, and, therefore, not much encouragement could be drawn from the figures for 1930. No one who had studied the subject would say that the problem was by any means solved, or that further immediate steps were not urgently needed.

A DISQUIETING SITUATION.

There were three grave and arresting factors in the present situation. The first was the adverse experience which the approved societies had suffered and the claim experience in respect of married women. In fact, the societies had been affected so seriously that the valuers in some instances, quite recently warned the societies that unless conditions improved to a marked extent the whole of the present surplus would be exhausted within a few years in providing ordinary benefit. A number of societies which specially catered for married women would have to cancel their additional benefit schemes—a very serious step indeed. Already a number of societies had cancelled such schemes. The Government actuary, in his report to Parliament a short time ago, stated that the claims of unmarried women had risen by 60 per cent. so far as sickness benefit was concerned, and the claims of married women had risen by 106 per cent. As regards disablement benefit, Sir Alfred Watson stated that the claims of unmarried women had risen by 100 per cent., and those of married women by 159 per cent. Another very curious feature was this: that among males it was the younger insured persons rather than the older whose burdens cast upon the approved societies had increased in recent years. The third factor was that the excessive claims, as far as a large proportion of insured persons were concerned, were more in the North of England than in the South. The following figures, which had been presented to the Ministry of Health, were very extraordinary and illuminating in regard to causes of incapacity: Excess per cent. of the northern area over the southern area—rheumatism, 50; nervous and mental disorders, 41; digestive disorders, 21. These were remarkable and difficult things to explain. Obviously, in connexion with a very large proportion of the population, unemployment and bad health must be considered contributory factors, but let no one think that this great increase of claims was due to deterioration in the national health. This was borne out by the Minister of Health himself. Could anything be done to prevent what was the real danger of the national health insurance system degenerating into an unfortunate position similar to that of the unemployment insurance system?

Since the House last discussed this question the Minister of Health had taken two very important steps in the right direction. He had endeavoured to strengthen the safeguards to be adopted by societies in connexion with the supervision of claims, and he had very strongly urged on approved societies the importance of maintaining an efficient system of sickness visitation; and, secondly, an early reference to the regional medical officers for examination of claims. The Minister had also taken certain steps with respect to the medical profession, and he (Sir Kingsley Wood) was in agreement with him there. Some advice, and, if necessary, some reminder, was required in that connexion. An amending regulation had been made with regard to change of doctor. That change had been made for obvious reasons, and he thought that anyone who had been associated with approved society administration during the last two or three years would agree that the change was very necessary. He asked the Minister whether he proposed to take further steps. Useful and desirable as the steps that he had taken might be, it was difficult to feel confident that sufficient had been done to rescue the national health insurance system from its present position.

NEED FOR HIGHER STANDARDS.

Mr. **Rhys Davies** said that up to date the approved societies had lost a sum of £25,000,000 as a result of the economy Act passed by the Conservative party. That would be sufficient to put all the societies in a sound financial position. Sir Kingsley Wood had made no criticism of the medical profession, and had also avoided dentists, opticians, and surgical appliance makers, all of whom seemed to have their eyes keenly fixed on the funds of approved societies. Sir Kingsley Wood was inclined to blame the 17,000,000 insured persons. He (Mr. Davies) hoped to prove that some of the blame rested with other people. He was satisfied that the standard of honour in relation to claims from the insured population, from the medical profession, the dentists, the opticians, and so forth, must be raised and improved, otherwise the scheme would ultimately fail in its objects. There was something fundamentally wrong in the relationship between the medical profession, the Ministry of Health, and the approved societies. There was no doubt at all that some members of the medical profession issued certificates that were absolutely unjustifiable. He had reason to pay tribute to the high skill and genius of the medical profession in this country, but this high skill did not enter into their business and administrative work. He thought that it should be brought home to the doctors the amount of damage that might be done to the funds of approved societies by the issue of certificates which ought not to be issued. The same remark applied to the dental officers. He had come to the conclusion that there was no way out of these difficulties until the doctors were in some way employed by the State.

EFFECT OF THE DEPRESSION.

Dr. **Morris-Jones** said that the excessive claim for sickness benefit under the national health insurance system was probably, apart from the deficiency in the unemployment insurance fund, the most serious matter with which Parliament and the Government had to deal at the present time. He was convinced that there was a tendency among all classes of the population, insured and others, to get as much as they possibly could. The next great factor was the serious economic position in the world, and especially in this country, and the unemployment position. It was not possible for a man who was a long time out of work to be really healthy. He was not now engaged in panel practice, but he had a long experience of it, and he considered that one great cause of the present position under this scheme was the economic depression which was affecting the physical and mental health of the insured population. If the House agreed with that view they would not agree that the medical profession, in the circumstances, was so much to blame. There was no more difficult problem before the profession at the present time than this question of sickness claims among insured persons, and its members were as alive to their responsibilities as the approved societies. There was one cause of the increase of sickness claims among women—namely, that a woman might still be able to do housework in her home, although she had been certified as incapable of following an outside occupation. From many years' experience he knew that very often, where a certificate had been given showing that a woman who was insured was not fit for an occupation in which she was insured, she was engaged in household work which in many cases would be as arduous as the occupation in respect of which she was receiving benefit. How that was to be dealt with was a problem, but it was responsible for a great deal of leakage under the national insurance system. He did not think that an inspector of an approved society should be allowed to dissect and analyse medical certificates, but he suggested that the Ministry of Health should state categorically that no insurance certificate should be accepted for such a thing as a cold or a chill. The phraseology of certificates should be more specific in character.

THE MINISTER'S MEMORANDUM.

Mr. **Meller** congratulated the Minister on the issue of memoranda, both to the approved societies and to the medical profession, which dealt very faithfully and frankly with the situation with regard to national health insurance. He (Mr. Meller) approached this subject with the very deepest respect for the medical profession, and there was no need for the medical profession to be troubled because the Minister had come to the conclusion that the state of affairs demanded some explanation. He thought the Minister was justified in bringing to the notice of the medical profession some of the results of the experiments and examinations which had been made, and in asking them to see whether there was something inherently wrong in the system itself, or whether there was something wrong with the health of the people of the country. Very nearly £9,000,000 was spent on medical treatment and medicines for the insured population. That was a vast sum to be spent on some 15,000 medical practitioners who came under the Act. Therefore they were entitled to ask this honourable profession that they should give a service worthy of the profession, with full honesty and due regard to the insured persons. Reference had been made in the debate to some of the causes of incapacity stated on medical certificates. There was loose certification certainly among some members of the profession, and quite recently he saw a certificate which contained the initials "I.D.K.," which he believed meant "I don't know." When a professional gentleman descended to that sort of thing there was cause for complaint.

Miss WILKINSON: Does the hon. Member object to the medical profession being honest occasionally?

Mr. MELLER said that he should have said that the certificate was hardly honest, and a little misleading, because he only surmised that "I.D.K." meant "I don't know." There was another certificate in reference to a person incapable of work for some weeks, stating that he was suffering from abrasion of the ribs, and it appeared that during the time he was upon the funds he engaged in a heavyweight boxing contest, and laid out his opponent in the fifth round. That sort of thing was, of course, unsatisfactory, but he did not claim that it was a typical sample of what was being done. On the contrary, very excellent service was given by the medical profession as a whole. He hoped the Minister would join in an exhortation to the medical profession to try and find out the cause of the present situation, and see whether it was in fact due to the bad health of the people or to something else.

In 1922, in England and Wales, 113,000 cases were referred for examination, and the figures gradually rose until, in 1930, 531,000 cases were submitted. Of the cases submitted for examination in 1922, 40 per cent. were found to be still incapable of work; 60 per cent. of the cases declared off, either because they did not attend for examination, or were found by the medical referee to be capable of work. One would have thought, if certification was going on in the very best way, that, as they began to increase the number of references, the number of persons found incapable of work would be increased also, and that those capable of work would have become less. But that was not so. When 531,000 persons were referred for examination only 34 per cent., as against 40 per cent. in 1922, were found incapable of work. The statements by the Minister in his Memorandum were a serious and grave indictment, whether against the insured person, the medical profession, or the approved societies. He was not attempting to lay a charge at the door of any one of the three, but it should go out from the House of Commons with a very loud voice that something had to be done to repair this state of things. It was not only a reflection on the medical profession, but a reflection upon the moral honesty of the people. If there was a good and honest reason for these things then they ought to know it, and he was sure that the Minister of Health would be only too glad to withdraw the allegations contained in the Memorandum. Arising out of the examinations, one thing stood out pre-eminently—namely, that the increase in the sickness experience was greater among married women than any other class. If married women stood alone their scheme would be insolvent. This matter had been considered by a body outside, and they stated that if the scheme with regard to married women was to be put upon a satisfactory basis, and married women were to be accepted as an insurance proposition, there were three courses open—namely, to increase the contributions to meet the risk, or to reduce benefits, or to deal with the matter somewhat on the lines of the present system; that was to say, when a woman married she must pass out of insurance, and if she subsequently entered the employment market, she must requalify for benefit. During the time of requalification a limited sickness and maternity benefit would be provided. He hoped the Minister would consider that particular point. Another point which deserved the attention of the Minister was the effect of a high sickness experience and a low contribution record. They could not keep the societies on a solvent basis if they put upon them the responsibility of providing full benefits while their contributions were declining. He hoped the Minister would do something to meet that situation. Apart from the drain upon the funds of approved societies through a sickness experience greater than had been expected, there was no more important matter to consider than the position of those persons who, if no assistance was forthcoming from the Government, would find their health insurance in jeopardy.

RESPONSIBILITIES OF THE PROFESSION.

Mr. THOMAS LEWIS said he thought the medical profession would say that a good deal of the increase of sickness was due to the reduced stamina of the people. Unless there was a marked change in our economic conditions the sickness experience would become worse, and, therefore, it was exceedingly important that societies should retain all their funds. His complaint was that the Ministry were endeavouring to force societies to adopt methods of sickness visitation and do work which the doctors would say was work which they alone ought to do. Except in rare instances, it should be the duty of the panel doctor to decide whether a person was entitled to be on the funds or not. He asked the Minister at the earliest possible moment to restore the amount which was stolen from the approved societies by the last Government.

Mr. PALMER said that panel practitioners ought to feel no less than the administrators of approved societies their responsibility for establishing the soundness of the health insurance scheme. He would like to feel that the medical profession were helping to prevent any "monkeying about" and people getting benefits to which they were not entitled. There was a difference between a doctor's certificate to establish a pensions claim and a type of certificate in respect of a claim for benefit under an approved society. It seemed to him that the medical profession could do, under the terms of certification, exactly what one was prepared to pay them well enough to do. He urged that every measure of coöperation should be tried before they got to the point of cutting benefits.

Miss RATHBONE said she would like to put forward one explanation of the excessive claims of married women. In every time of depression in industry it was the married woman who felt the pinch. The decreased state of health of married women through that cause was one of the reasons for the increase in their claims.

Miss SUSAN LAWRENCE (Parliamentary Secretary to the Ministry of Health) said Miss Rathbone was right when she said that times of unemployment and stress pressed most hardly on the mother in the home. She thought Mr. Meller was a little hard on the medical gentlemen to whom he had referred. The doctor who wrote "I.D.K." on the certificate was a person she regarded with some liking. It was very much the same thing as when a general practitioner said that he required a second opinion. She was certain, knowing a little about the society to which Mr. Meller had referred, that if the certificate came in it was received in exactly that sense, and that a second medical opinion was hurried to the bedside of the patient. It was the business of the Ministry of Health to try to assimilate all the various points of view. After long and careful reports the Ministry had come to the conclusion that, making every allowance for the effects of unemployment and depression, the whole of the sickness claims made on approved societies could not be altogether accounted for by those causes. The last circular was sent out by the Ministry on May 31st last, and the Ministry was holding conferences with the approved societies. It was rather early to suggest any further measures. The central fund was not in a very good position. It reached a maximum of over £1,500,000, but it had since been seriously depleted owing to the necessity of making grants to societies who were in a deficiency through causes beyond their control. That was a serious matter, and the financial position of the fund was engaging the earnest attention of the Minister. It was possible that a levy might be one of the subjects to be discussed, but that was a matter for further consideration. She could not give any more definite information at the moment. With regard to the third valuation, a number of societies had found their disposable surplus reduced, and some of them had been compelled to curtail additional benefits previously provided. The financial basis of the insurance scheme would have the careful attention of the Minister in the near future. With regard to the prolongation of insurance, the Ministry was now in conference with the approved societies and the Minister hoped to be able to announce a decision very soon on the matter.

MORE DRASTIC STEPS.

Sir T. **Inskip** said he was sorry that Miss Lawrence was not able to give the Committee a little more guidance. A question which she did not wholly face was what the Minister was going to do about the present position. He had called attention to the necessity or desirability of doctors being, perhaps, a little more careful, but the position called for something more definite and more drastic than a mere suggestion of that sort. Mr. Rhys Davies had suggested that the doctors should be brought more in touch with the consequences of their certificates, and that they should be made to realise how much money depended on the grant of a certificate. He (Sir T. Inskip) was not sure that that was the right way to enable the doctors to do their duty. A doctor should use his medical skill by addressing his mind to the condition of the patient, and not by considering what might be the consequences, great or small, of granting a certificate. The hon. Member had also suggested that the medical service should be nationalised. He did not believe that any doctor in the House would agree with the proposal, and he did not envy the task of the Minister of Health if such a proposal were ever adopted. Two other proposals which had been made were rather more helpful. One was that a little more attention should be given to sick visitation, and the other was that the operation of the regional medical staff should be speeded up. He was sorry to hear Miss Lawrence say that a levy upon the central fund was under grave consideration. The result of such a levy would be to make the good societies pay for the lax administration of the bad societies. The central fund existed for well-defined purposes, and the Minister ought to be quite certain that he had exhausted all the possibilities of improving the administration of the societies in relation to claims before he allowed any such levy.

PATIENTS' GRIEVANCES.

Sir E. **Graham-Little** said he wished to make an earnest appeal to the Minister to reconsider certain points of prime importance. They ought to make the medical service under national health insurance approximate as closely as possible to the conditions of private practice. The latest regulation in regard to the change of panel doctor was seriously disliked by the medical profession, and a unanimous resolution was passed at a representative meeting protesting against that particular restriction. The psychological effect of a free choice of doctor could hardly be overestimated, and he was sure that the Minister had not considered that aspect sufficiently. It was one of the facets of the problem which would be disastrously affected by a State medical service. He asked the Minister to give his attention to the difference in the treatment between private and insured persons, represented by the limitations of panel prescriptions. He hoped the Minister would be prepared to revise the agreement made in 1927. The Minister should not be too severe on panel practitioners who were trying to give as good a service to panel patients as to their private patients, and were being penalised for doing it. Dissatisfaction by insured persons and by the public generally with the National Health Insurance Act was a real thing, and one of the indications of it was the enormous rise in the number of attendances at voluntary hospitals during the last 12 years. A great proportion of his own patients were dissatisfied with their treatment under the panel doctors, and at the hospital with which he was associated the figures showed that the patients included a large proportion of insured persons. His experience was confirmed by the figures of other hospitals. His own hospital dealt with 50,000 out-patients last year, and he believed a similar number was dealt with at Guy's Hospital. There was no doubt that many of the reasons for the dissatisfaction with the national health insurance system could easily be removed. Lord Hewart had described the Minister of Health as a pure despot; he (Sir E. Graham-Little) invited him to exercise his despotism in rectifying these defects.

ECONOMY AND EFFICIENCY.

Lieut.-Colonel **Fremantle** said it was the desire and the determination of the whole House to maintain the efficiency of the health services within the limits of the exhaustable purse. There was far too great a tendency to think that the real progress of expansion must be in bricks and mortar. In this time of straitened finance the Minister was not necessarily reducing progress if he tried to make the most use of the services which already existed. He asked the Minister what was being done to make use of the voluntary hospitals in the combined scheme under the Local Government Act of 1929? It might be necessary one day to have an official hospital service, but he did not believe it, and he hoped not. At the present time in the interests of the sick poor, and owing to the exhausted purse, he asked the Minister, while it was not too late, to see that officialdom met voluntaryism, and that opportunities were provided for their combination.

THE MINISTER'S REPLY.

Mr. **Greenwood** (Minister of Health), replying to the debate, said that Sir T. Inskip wanted more attention paid to sick visitation. Half the complaints made to-day were to the effect that there was too much. Again, he suggested that there should be greater use of regional medical officers. That also had been one of the complaints. There had been on some sides of the House, perhaps, a little too much emphasis on improper insurance claims. There was not the slightest doubt that there were improper claims. He would gladly sweep all those people out of benefit, but they had to be careful that in tightening their administration they were not denying just claims. Improved administration and greater coöperation between all the agencies concerned were having a very substantial effect. In 1930 the total expenditure of all approved societies on sickness and disablement benefit was £2,000,000 less than in the previous year. It might be that 1930 was a lighter year for sickness, but he thought part of that saving was undoubtedly due to improved administration and to more effective coöperation between the panel doctors, the regional medical officers, and the approved societies. The improvement of last year had continued during the first half of this year, and the sickness claims for the quarter which had just finished were the lowest for any quarter for several years past; so that the steps that had been taken were now beginning to prove effective.

In reply to Sir E. Graham-Little, he might say that they had not got rid of the free choice of doctor. They had partly limited the rapidity with which an insured person could run from one doctor to another. That had been done in the interests of the medical profession, as well as in the interests of the insured persons, and the Ministry stood by that action. He was satisfied that in the long run it would be found to be in the interests of the medical profession. In connexion with institutional services there was a conflict of opinion between the doctors and the approved societies. There was a reasonable working scheme which, while it did not completely satisfy everybody, was working pretty well.

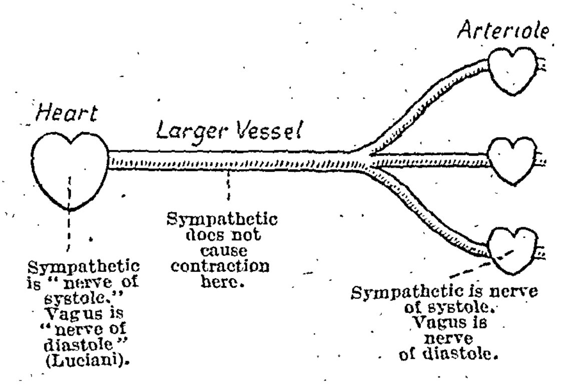
CORRESPONDENCE

VASCULAR PERISTALSIS.

To the Editor of THE LANCET.

SIR,—I was much interested in your reference to my book, "The Hearts of Man," in your annotation (p. 254) on Vascular Peristalsis. The book was read by the late Sir James Mackenzie, to whom I had the honour to be assistant for a number of years. He would neither accept nor reject my findings, but agreed with me that no explanation which entirely satisfied him had been given of the so-called dicrotic waves.

You say in your annotation: "It is difficult to conceive of a peristaltic wave which could travel at the same rate as the pulse, while if it did not do so a pulse tracing should show two different and asynchronous waves." It was my contention that this is exactly what pulse tracings do show. They show (1) the main wave caused by the contraction of the left ventricle, and (2) smaller waves called dicrotic or post-dicrotic, which, I suggested, are really peristaltic waves in the vessel wall and not waves set up by the closure of the aortic valves. I tried to explain myself by reference to the bowel where, when peristalsis is active, the sphincters are open in inhibition and where, when the sphincters are active—i.e., shut—peristalsis is inhibited, and would therefore not be seen in a tracing. The heart was recognised by Gaskell as a sphincter, and is innervated like the other sphincters. The innervation of the larger arteries seems, on the contrary, to be similar to that of the bowel between the sphincters, *until the arterioles are reached*, when a similar innervation to that of the heart is encountered. I visualised these arterioles, therefore, as so many small sphincters or "hearts" acting in unison (synchronously) with the heart itself. The accompanying diagram illustrates the mechanism. These findings were arrived at by a very prolonged study of polygraph tracings, all of which were submitted to Sir James Mackenzie. The work of Luisada, to which you refer, certainly seems to lend support to these ideas.


Arteriole
Heart
Larger Vessel
Sympathetic does not cause contraction here.
Sympathetic is "nerve of systole." Vagus is "nerve of diastole" (Luciani).
Sympathetic is nerve of systole. Vagus is nerve of diastole.

I am, Sir, yours faithfully,

July 30th, 1931. R. M. WILSON.

TOXIC EFFECTS OF INTRAVENOUS SALYRGAN.

To the Editor of THE LANCET.

SIR,—In his article in your issue of July 18th Dr. C. T. Andrews attributes the symptoms observed by him in one case immediately following the intravenous injection of salyrgan to the toxic effects of the drug. May I venture to suggest that these symptoms were not due to the salyrgan, but to the intravenous injection, per se, in an individual whose cardiovascular system and water-balance were already very much at fault? One experiences symptoms of similar nature occasionally after the administration of almost any kind of intravenous injection. Some years ago, when engaged in studying the effect of isotonic, hypertonic, and hypotonic solution upon the water-balance, I sometimes saw similar effects from small quantities of distilled water. My personal experience with salyrgan dates from its first introduction, and I have never seen any unfavourable results, although I well remember toxic effects, and even death, after novasurol. The symptoms in these cases were those of acute mercurial poisoning. May I mention that I always give salyrgan in its original concentration, without further dilution by distilled water?

I am, Sir, yours faithfully,

Weymouth-street, W., July 30th, 1931. O. B. BODE.

VEHICLES FOR CHEMICAL CONTRACEPTIVES.

To the Editor of THE LANCET.

SIR,—The annotation in your issue of August 1st encourages me to report the progress made since the publication of the article to which you refer. During the last few years, under the auspices of the Birth Control Investigation Committee, I have tested the spermicidal powers of many foaming tablets and cocoa-butter suppositories. I have found foaming tablets the more spermicidal, with both human and guinea-pig sperms. Now many clinical workers consider cocoa-butter suppositories more reliable than foaming tablets. A few insoluble substances (e.g., stearin and paraffin) have been said to be harmful to certain micro-organisms and sperms, if placed in the same dish.[1] This phenomenon, however, will not account for any contraceptive action of cocoa-butter, for sperms are extremely active in glass vessels containing this fat, if suspended in suitable fluids. As is pointed out in your annotation, it must be supposed that the contraceptive action of cocoa-butter is due to its forming a film over the cervix, which acts as a mechanical barrier to sperms. This mechanical barrier, which is not tested in my experiments, may be very important.

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[1] Drzewina, A., and Bohn, G.: Compt. rend. de l'Acad. des Sci., 1927, clxxxv., 875.

There is, however, one great disadvantage in cocoa-butter. I have shown that it hinders the action of chinosol and quinine bisulphate in a remarkable way, so that their effect upon sperms is much reduced. A new fat has now been tried as a vehicle for chinosol. This is a proprietary preparation called cocoala. I find that this fat does not hinder the action of chinosol on sperms. The contraceptive value of insoluble vehicles is now being studied under the Birth Control Investigation Committee. If, as seems likely, cocoala is found to have the same mechanical effect as cocoa-butter, it is obviously preferable. It has the further advantage of being very nearly odourless.

The experiments were carried out by throwing one suppository into 7·5 c.cm. of guinea-pig sperm suspension, maintained at the temperature of the body, and estimating the activity of the sperms after a quarter of an hour. Maximum activity is recorded as 3+, and no movement whatever as 0. The other signs indicate intermediate degrees of activity. No experiment is recorded unless the control sperms show an activity of 3 or 3+. The more effective suppositories were further tested by substituting one-tenth for a whole one. Three or four experiments were performed with each suppository at each concentration. They are arranged below in the order of their spermicidal powers, beginning with the most spermicidal.

—	One suppository to 7·5 c.cm.	One-tenth suppository to 7·5 c.cm.
Grs. 3 chinosol in cocoala	0 0 0 0	2 2 2 3
Grs. 1½ " " "	0 0 1 1	3 3+ 3+
Grs. 3 " " cocoa-butter ..	1+ 3 3 3+	—
Grs. 5 quinine bisulphate in cocoa-butter	2+ 3 3 3	—

The superiority of cocoala as a vehicle for chinosol is evident.

I may add that a new large foaming tablet called Kontrol gives the best results of any yet tested by the guinea-pig sperm technique. Not the slightest movement of a single sperm was seen in six experiments at the concentration of one-tenth of a tablet to 7·5 c.cm.

I am, Sir, yours faithfully,
JOHN R. BAKER.

Department of Zoology and Comparative Anatomy,
University Museum, Oxford, August 3rd, 1931.

MORTALITY AFTER PROSTATE OPERATIONS

To the Editor of THE LANCET.

SIR,—Mr. J. Swift Joly, in your issue of July 18th puts very clearly the importance of the pre- and post-operative treatment in relation to prostatectomy, but he also compares general anæsthesia with spinal slightly to the disadvantage of the latter. He says that spinal anæsthesia is ideal from the surgeon's point of view; it gives complete relaxation and makes the operation easier than any other form of anæsthetic. With this I entirely agree, but he adds that it has certain disadvantages to the patient, the most important of these being a fall of blood pressure which increases the risk of reactionary hæmorrhage and seriously diminishes the urinary excretion during the first 24 hours after operation. In my experience these disadvantages need not appear under spinal anæsthesia by the combined method. The 402 consecutive cases of prostatectomy under spinal anæsthesia which I reported in your issue of June 27th were mixed hospital and private cases. The total mortality was just under 5 per cent., and if the purely accidental deaths, in which the cause of death had no relation whatever to hæmorrhage, diminished urinary secretion or uræmia from infection be excluded, the mortality is just under 4 per cent. The following is the technique I use for this combined form of anæsthesia:—

Nitrous oxide and oxygen, A.C.E. and oxygen, or ether and oxygen is given, the drug being chosen according to the particular case. The anæsthesia is carried to unconsciousness, not surgical anæsthesia. An intrathecal injection is then given in the second lumbar space of either 0·02 g. of stovaine or 0·04 g. of novocaine in normal saline. The finest needle now in use must be used or the dose will not be sufficient. Relaxation of the lower abdominal wall will be *obtained*. The operating table must be kept in a slight slope, head downwards, all the time. When the patient is moved from the theatre this slight slope should be maintained on the trolley, and he should be placed in bed with blocks already under the foot of the bed. When the patient is back in bed the blood pressure will be found to be approximately the same as before the operation, and there will be no increased risk of reactionary hæmorrhage or diminished urinary secretion. I am authorised by Mr. Sydney Macdonald to say that "in employing spinal anæsthesia in accordance with the above technique there is less hæmorrhage at the time of operating, as with the relaxation obtained one is less liable to get outside the proper line of cleavage, less reactionary hæmorrhage, no shock, and less interference with urinary secretion afterwards."

Quite lately I had to anæsthetise two big men, both very fat, aged 75 and 78, respectively. The physicians in charge of these cases vetoed any form of inhalation anæsthesia because of the extreme amount of emphysema and chronic bronchitis present. The first case was given 0·035 g. stovaine by the fine needle; the second was given 0·04 g. by a slightly larger needle. Both made uninterrupted recoveries.

I am, Sir, yours faithfully,
H. M. PAGE.

Blandford-street, W., August 4th, 1931.

A BARNSLEY CONVALESCENT WARD.—Lady Sutherland last week opened a convalescent ward at the Beckett Hospital, Barnsley, which has cost about £600, and is the gift of the Wharncliffe Woodmoor Colliery owners and workmen.

NORTH DEVON INFIRMARY.—Last year this Barnstaple Hospital (72 beds) received 824 in-patients, who stayed on an average 21 days, and cost an average of £7 4s. 3*d.* each. Of the 1423 out-patients 544 were accident and emergency cases.

WAKING OF PATIENTS IN HOSPITAL.—The Minister of Health has issued a memorandum to all county and county borough councils drawing attention to the report on patients' waking hours in London voluntary hospitals, published by King Edward's Hospital Fund for London, and suggesting that the councils will no doubt wish to consider the question of adopting the recommendations in the administration of their own hospitals.

to panel patients which would be given to private paying patients and which treatments were in general use in private medical practice: and what were the reasons for this prohibition.—Mr. GREENWOOD replied: I am not aware of any such regulations as my hon. friend mentions. Insurance practitioners are required in all ordinary cases to give to their patients all proper and necessary medical services other than those involving the application of such special skill and experience as is not to be expected of general practitioners as a class, and to order or supply such drugs and prescribed appliances as are requisite for the treatment of any patient.

Health Insurance Benefit and Rheumatic Diseases.

Mr. GRAHAM WHITE asked the Minister of Health the approximate amount of national health benefit paid in any recent years in respect of sickness arising from rheumatic diseases.—Mr. GREENWOOD replied: The information desired by the hon. Member is not available and could only be obtained as the result of a special investigation and return by every one of about 7000 approved societies and branches. It has, however, been estimated on good authority that one-seventh of the total invalidity amongst insured persons is due to rheumatic diseases, and on this basis the cost involved for the year 1930 would have been about £2,500,000.

Cost of Dental Benefit.

Mr. THOMAS LEWIS asked the Minister of Health if he would lay upon the Table a statement of the expenditure of the Regional Dental Service and the Dental Benefit Council, showing the cost of establishing the organisation, the number of cases dealt with, and the running expenses.—Mr. GREENWOOD replied: I will bring my hon. friend's request to the notice of the Dental Benefit Council.

Patent Rights of a Dental Process.

Mr. BUCHANAN asked the Minister of Health his reason for refusing to accept the offer of Dr. Watson, of 2, Third-avenue, King's Park, Glasgow, to give his department the patent rights of a process for extracting, disinfecting, and replanting teeth, and a machine for the purpose of boring and tapping teeth; and whether he was aware that America had accepted the patent rights.—Mr. GREENWOOD replied: I have not considered it desirable to take advantage of Dr. Watson's offer because, as has been explained to him on several occasions, his proper course is to follow the customary practice of making full scientific publication of his methods and results, with a view to trial and criticism by his professional colleagues. I have no information on the second part of the question.

FRIDAY, JULY 31ST.

Telephone Instruments and Hygienic Precautions.

Mr. WOMERSLEY asked the Postmaster-General whether he was aware that the new type of hand-microphone instrument, for which an extra rental was charged, could not be taken to pieces for cleaning, and if he would take action to enable cleaning to be done to avoid unhygienic conditions that might otherwise arise.—Mr. VIANT (Assistant Postmaster-General) replied: It is not necessary to take telephone instrument to pieces in order to maintain it in hygienic condition. Dismantling is very liable to dama the delicate parts of the instrument, and it is undesirab to facilitate such action.

MEDICAL NEWS

University of Cambridge.

On July 28th the following degrees were conferred:—

M.D.—*R. W. B. Ellis, * J. E. D. Crozier, E. E. Llewellyn, A. E. Naish, W. D. Newcombe, and A. W. Spence.

M.B.—*R. H. B. Snow.*

B. Chir.—H. S. Buckland, W. A. Fell, C. R. T. Lane, *E. H. W. Lyle, R. G. Orr, P. G. Scott, H. C. Stewart, and J. W. Summerhayes.

* By proxy.

Royal College of Physicians of London.

At a meeting of the College on July 30th with Lord Dawson, the President, in the chair, the following Fellows of the College were elected officers for the ensuing year:—

Censors: Dr. James Collier, Dr. W. Langdon Brown, Dr. C. R. Box, and Sir Charlton Briscoe. *Treasurer:* Dr. S. P. Phillips. *Registrar:* Dr. Raymond Crawfurd. *Harveian Librarian:* Dr. T. H. Arnold Chaplin. *Assistant Registrar:* Dr. Robert Oswald Moon. *Library Committee:* Dr. H. R. Spencer, Dr. C. J. Singer, Dr. Anthony Feiling, and Dr. J. D. Rolleston. *Curators of the Museum:* Dr. H. R. Spencer, Dr. Hugh Thursfield, Dr. S. E. Dore, and Dr. Harold Gardiner-Hill. *Finance Committee:* Dr. Robert Hutchison, Sir Percival Horton-Smith-Hartley, and Dr. L. S. T. Burrell.

The following were elected Examiners:

Chemistry: Mr. H. W. Cremer and Mr. W. B. Tuck, D.Sc. *Physics:* Mr. D. Orson Wood and Mr. F. L. Hopwood, D.Sc. *Practical Pharmacy:* Prof. J. A. Gunn, Dr. W. E. Dixon, Dr. Philip Hamill, Dr. Newman Neild, and Dr. Orlando Inchley. *Physiology:* Prof. Joseph Barcroft, F.R.S., and Prof. R. J. S. McDowall. *Anatomy:* Prof. Duncan Blair. *Pathology:* Dr. C. E. Lakin, Dr. George Graham, Prof. Matthew Stewart, and Dr. H. W. C. Vines. *Medical Anatomy and Principles and Practice of Medicine:* Sir Thomas Horder, Dr. A. E. Russell, Dr. Cecil Wall, Dr. David Forsyth, Dr. E. A. Cockayne, Dr. Reginald Miller, Dr. E. P. Poulton, Dr. Albert Ramsbottom, Dr. A. C. D. Firth, Dr. E. Bellingham Smith, Dr. L. S. T. Burrell, and Dr. Ivor J. Davies. *Midwifery and Diseases Peculiar to Women:* Mr. J. P. Hedley, Mr. J. B. Banister, Mr. D. W. Roy, Prof. Daniel Dougal, and Mr. A. C. Palmer. *Public Health:* (Part I.) Dr. G. Roche Lynch. (Part II.) Dr. G. F. Buchan. *Tropical Medicine:* Dr. J. A. Arkwright, F.R.S., and Dr. N. Hamilton Fairley. *Ophthalmic Medicine and Surgery:* Dr. T. Grainger Stewart. *Psychological Medicine:* (Part I.) Dr. Edward Mapother. (Part II.) Dr. J. G. Porter Phillips, and Dr. S. A. K. Wilson. *Gynæcology and Obstetrics:* Prof. J. M. Munro Kerr. *Laryngology and Otology:* Mr. Lionel Colledge. *Murchison Scholarship* (1932): Dr. Theodore Thompson and Dr. O. L. V. de Wesselow.

The following Fellows were elected members of the Advisory Committee to the President:—Dr. H. Morley Fletcher, Dr. Robert Hutchison, Dr. A. M. H. Gray, Dr. H. L. Tidy, Dr. H. H. Dale, Dr. J. A. Ryle, and Dr. T. Watts Eden.—Dr. James Collier and Dr. W. Langdon Brown were appointed to represent the College on the Mackenzie-Mackinnon trust committee, and Sir Humphry Rolleston was re-elected representative on the executive committee of the Imperial Cancer Research Fund.—The President, Lord Dawson, will represent the College at the celebrat of the 250th anniversary of the Royal College of Physic of Edinburgh.

The President announced that he had appointed George Newman to be Harveian Orator and Dr. Dug Baird to give the Bradshaw lecture, both in 1932. (T forthcoming Harveian oration in October next will delivered by Dr. Robert Hutchison).—In addition to t appointments to Lectureships announced at the last meetin Miss Harriette Chick, D.Sc., was appointed Oliver-Sharp lecturer and Dr. L. P. Jacks the Lloyd Roberts lecturer fo 1932.

The Baly medal, awarded every alternate year to t person who shall be deemed to have most distinguish himself in the science of physiology during the two years immediately preceding the award, was awarded to Prof W. B. Cannon of Harvard University. The President also announced the award in Edinburgh of the Murchiso scholarship jointly to W. M. Arnott and R. J. Kellar.

The following candidates, having satisfied the Censors' Board, were admitted Members of the College:

Wilbert Hurst Brown, M.B.Oxf., Ernest Thomas Conybeare, M.B.Lond., Edward Philip Nagle Creagh, M.B., N.U.I., Hugh Crichton-Miller, M.D.Edin., Ratansha Dinsha Dalal, L.R.C.P., Courtenay Nisbet Evans, M.B.Lond., Joseph Hayes Fairweather, M.D.Edin., Mohamed Gamil Farid, M.B.Cairo, Theophil Johannes Friedrich Frank, M.D.Melb., Clifford Allchin Gill, L.R.C.P., Thomas Howard Gillison, M.B.Edin., John Howell Halliday, M.B.Sydney, Henry Procter Hutchinson, M.B.Camb., Harold Gordon McGregor, M.B.Lond., Robert Michael Maher, M.D.Lond., John Onbridge Mercer, M.B.N.Z., Herbert Leslie Milles, L.R.C.P., Wilfrid George Oakley, M.B.Camb., Rupert Samuel Bruce Pearson, M.B.Oxf., Evelyn Nora Popper, M.D.Lond., Mostyn Levi Powell, M.B.Melb., Gangandram Venkataswami Ram Mohan, M.B.Madras, Douglas Riding, M.D.Liverp., William Carey Smallwood, M.B.Birm., Tej Raj Swarup, M.B.Lucknow, L.R.C.P., Abd El Kader Talkhan, M.B. Cairo, Alfred Brian Taylor, M.B.Birm., Geoffrey Fawsitt Taylor, L.R.C.P., Thomas Tennent, M.D.Glasg., Hugh Ferguson Watson, M.D.Glasg., Charles Edward Walton Wheaton, M.D.Lond., and Bertram Alan Young, M.D.Lond.

Diplomas of L.R.C.P. were conferred upon 140 candidates (120 men and 20 women) who have passed the Final Examination of the Conjoint Board and complied with the by-laws of the College. The following are the names and medical schools of the successful candidates:—

A. M. M. Ali, Bombay and Middlesex; E. Anthony, London; Grace M. Archer, Westminster; H. G. E. Arthure, Charing Cross; Doris Ascough, Manchester; P. T. Ashby, Camb. and London; E. S. Asiedu-Ofei, Birmingham; E. J. Baldwin, Oxford and St. Thomas's; A. V. Baliga, Bombay and King's Coll.; K. Baxter, Manchester; R. A. Beazer, Oxford and St. Thomas's; W. D. Bell, Camb. and St. Bart.'s; W. H. Bradbeer, Guy's; R. J. B. Broad, Middlesex; G. O. Brooks, Camb. and St. Mary's; J. M. L. Burtenshaw, Oxford and Guy's; C. R. Caffry, Dublin and London; Beatrice L. Campion, Royal Free; A. M. Cantor, Guy's; P. Chandra, Punjab and Cambridge; E. F. Claridge, London; Barbara G. C. Clarke,

R. C. Coben, and C. P. Collins, Univ. Coll.; J. G. Connell, Camb. and Sheffield; H. A. Constable, Guy's; A. B Cook, St. Bart.'s; E. J. Currant, Camb. and London; D. Davidson, Univ. Coll.; V. S. H. Davies, M.B. Liverpool; J. R. Duffield, Camb. and Westminster; S. Durham, Oxford and London; K. V. Earle, Camb. and St. Thomas's; G. G. M. Edelsten, Oxford and St. Bart.'s; G. R. Ellis, Camb. and Liverpool; E. St. J. C. Emerson, St. Mary's; L. S. Everett, Camb. and King's Coll; P. B. Fernando, L.M.S. Ceylon, Univ. Coll.; G. A. Fleet, M.D. McGill; M. J. Garber, Guy's; H. N. Garrns, Camb. and Guy's; V. Glass, Univ. Coll.; S. Goide, Charing Cross; C. E. D. H. Goodhart, Camb. and St. Bart.'s; G. H. Gool, Guy's; W. H. Greany, Oxford and Guy's; H. F. Green, Camb. and St. Bart.'s; A. Greenberg, St. Bart.'s; H. J. Griffiths, Middlesex; Hilary S. M. Hadaway, Royal Free; Winifred S. Hall, Univ. Coll.; H. A. R. Hamilton, St. Thomas's; D. C. Harris, Middlesex; A. E. T. Hart, Camb. and St. Thomas's; E. S. Harverson, Univ. Coll.; J. R. Heming, St. Thomas's; E. Hinden, Camb. and St. George's; L. C. Holland, Bristol; J. H. Hughes, M.B. Liverpool; Blaguigna Illitch, Royal Free; N. M. James, Camb. and King's Coll.; J. E. Jenkyn-Thomas, Camb. and St. Bart.'s; W. P. Jenson, Camb. and Westminster; D. Johnson, Bristol and King's Coll.; Annie L. Jones, Univ. Coll.; Esther P. W. Jones, Cardiff and Charing Cross; Alice M. Kaye, King's Coll.; C. A. Keane, St. Bart.'s; Mary L. R. Kennard, and S. J. Knight, St. Mary's; M. Kosloff, Guy's; L. Lamb, Cardiff and Guy's; J. S. Lane, L.M.S.S.A. Camb. and Guy's; P. R. K. Lane, Birmingham; A. M. P. Laurent, Univ. Coll.; H. G. Letcher, M.B. Adelaide; T. M. A. Lewis, Cardiff and London; H. L. Lightstone, Middlesex; M. A. Lloyd, St. Bart.'s; J. W. McLaren, Camb. and St. Thomas's; J. W. Macmillan, Camb. and St. Thomas's; G. A. M. Madel, Middlesex; W. Meanley, Sheffield and Leeds; E. K. K. Menon, Birmingham; A. K. Monro, Camb. and London; P. B. Moroney, M.B., Liverpool; W. J. Morris, Liverpool; I. Moshinsky, Guy's; H. C. Muirhead, Guy's; R. W. C. Murray, Camb. and Birmingham; T. F. B. Noble, London; L. G. Norman, Univ. Coll.; Catherine O'Connor, Manchester; Angela M. S. A. enheim, King's Coll.; Lily M. O'Hanlon, King's Coll.; G. F. etty, St. Bart.'s; A. L. Potter, M.B. Liverpool; Eluned M. uleston-Jones, Royal Free; J. Rabinovitch, Leeds; G. F. ees-Jones, Univ. Coll; D. Y. Richardson, Durham; J. C. oberts, and H. D. Robertson, St. Bart.'s; C. H. Rogerson, Guy's; N. L. Rusby, Oxford and St. Thomas's; P. C. Sanyal, M.B. Calcutta, Middlesex; M. N. Sardena, M.B. Punjab, Schrire, M.B. Cape Town; E. Sharpe, Camb. and Guy's; W. H. Shawcross, Camb. and King's Coll.; M. H. Sherwell, M.B. Birmingham; Rosalie Shoenberg, Royal Free; A. B. mmons, King's Coll.; H. Simmons, St. Bart.'s; H. Singh, M.B. Punjab, St. Bart.'s; J. C. Smith, M.B. Manchester; G. Snell, St. Thomas's; R. G. W. Southern, St. Thomas's; dys M. G. Spencer, Camb. and King's Coll.; Violet Spiller, M.D. Geneva, Royal Free; A. A. Sreenivasan, Bombay and Charing Cross; T. Standring, King's Coll.; C. Starkie, Manchester; Swaminathan, Bombay and Manchester; R. A. Sykes, Camb. and St. Bart.'s; A. K. Talkhan, M.B. Cairo, G. Tattersall, Manchester and Univ. Coll.; Winifred P. Thomas, Univ. Coll.; F. Townsend-Coles, London; J. G. Vincent-Smith, Camb. and St. George's; A. B. Water, Camb. and St. Bart.'s; J. H. ay, Leeds and Middlesex; G. Wells, St. Bart's; M. Westwood, Camb. and St. Bart.'s; S. O. Widman, St. Thomas's; E. W. M. Williams, Cardiff; Dorothy Woodman, Royal Free; S. L. right, Univ. Coll.; A. H. Zair, Camb. and Birmingham; Zeitlin, London.

The undermentioned diplomas were conferred jointly with the Royal College of Surgeons upon the following candidates:—

D.T.M. & H.—E. S. Adderley, B. P. Baliga, C. J. H. Brink, A. Burnett, R. Caldera, H. P. Chaudhuri, H. D. Cronyn, B. R. sa, C. H. Howat, A. J. Johnson, F. B. Khambatta, R. K. Khanna, P. B. Lee Potter, H. W. H. McClelland, S. H. Moore, Ethel Morris, J. L. Razdan, J. A. Rosset, V. Sivalingham, M. Syddiq, J. Taylor, P. G. G. Unnithan, L. A. F. Wiles, W. Williams, W. E. S. Winn.

D.O.M.S.—M. Basheer, G. H. B. Black, M. G. J. Booysen, A. Brew, Eleanor M. P. Brock, C. Budeiri, A. Campbell, Franks, A. W. Green, E. G. Kennedy, Edith G. Limmex, Macky, K. C. S. Menon, Catherine E. Orr-Ewing, B. W. Roffey, K. Saha, R. Sampson, M. N. Sardana, R. C. Tarapore, L. St. V. Welch.

D.P.H.—L. W. Cann, Irene E. Chandler, Anne A. Craig, J. Crawford, M. B. Daver, T. W. Davies, D. M. de Silva, D. Diamond, C. F. Dolman, M. J. Evans, T. I. Evans, Sarah P. M. Griffiths, C Hill, Kathleen M. Horton, J. E. Haward, Amy L. Jagger, A. B. Kettle, Catherine B. McArthur, Hilda K. McKernan, J. Portelly, J. F. Southward, T. W. Stallybrass, R. Stuart, R. J. Toleman, Olga F. Tregelles, E. W. Vaughan, Nora W. Wamsley.

D.P.M.—G. J. Bell, L. J. Bendit, A. Cannon, C. R. Cooke-Taylor, J. A. F. Denyssen, S. B. Hall, J. G. Hamilton, S. D. Isaacs, J. M. Loftus, Joyce McConnell, G. W. Murray, C. J. Thomas, L. M. Webber.

D.L.O.—G. E. Archer, M. G. J. Booysen, E. E. L. Burnier, G. V. Joglekar, B. V. P. Reddy.

Royal College of Surgeons of England.

An ordinary meeting of the Council was held on July 30th with Mr. R. P. Rowlands, vice-president, in the chair.

Diplomas of Membership were granted to the candidates whose names appear elsewhere as new licentiates of the Royal College of Physicians. Diplomas in Tropical Medicine and Hygiene and in Ophthalmic Medicine and Surgery were also granted jointly with the College of Physicians.

On the nomination of the Canadian Medical Association, Dr. J. C. B. Grant, professor of anatomy, and Mr. C. H. Best, professor of physiology, were appointed assessors for the Primary Examination for the Fellowship to be held in Toronto next October.

University of London.

At recent examinations the following candidates were successful:—

M.D.

Branch I. (Medicine).—Ilahi Bakhsh, and Philip Berry, Guy's Hosp.; Alexander Cohen, London Hosp.; Dorothy Collishaw, London (R.F.H.) Sch. of Med. for Women; G. I. Davies, Univ. Coll. Hosp.; R. P. P. Davies, St. George's Hosp.; Archibald Gilpin, King's Coll. Hosp.; M. L. Mistri, Guy's Hosp.; Mary E. Pease, Univ. Coll. Hosp.; G. C. Pether, Middlesex Hosp.; David Preiskel, St. Bart.'s Hosp.; J. H. Simmons, and G. E. F. Sutton, King's Coll. Hosp.; C. E. W. Wheaton, St. Thomas's Hosp.; E. A. Wood, and B. A. Young, Univ. Coll. Hosp.

Branch II (Pathology).—J. N. Cumings, King's Coll. Hosp.

Branch III. (Psychological Medicine).—F. E. E. Schneider, Univ. Coll. Hosp.

Branch IV. (Midwifery and Diseases of Women).—Harriet E. Acheson, London (R.F.H.) Sch. of Med. for Women; D. A. Blount, St. Bart.'s Hosp.; Bridget S. P. Gurney, and M. R. Jones, London (R.F.H.) Sch. of Med. for Women; Joyce Morgan, Westminster Hosp.; K. I. Parkes, King's Coll. Hosp.; and T. B. Pearce, St. Thomas's Hosp.

Branch VI. (Tropical Medicine).—R. V. Bowles, Univ. Coll. Hosp.; and G. P. Patel, Grant Med. Coll. Bombay, and London (R.F.H.) Sch. of Med. for Women.

M.S.

Branch I. (Surgery).—Mark Coleman and R. S. Pilcher both of Univ. Coll. Hosp.

Branch IV. (Laryngology, Otology, and Rhinology).—A. G. Tresidder, London Hosp.

Forthcoming Lectures.—Three lectures on the Production, Distribution, and Value of Milk will be given by Prof. R. Stenhouse Williams, M.D., at the London School of Economics on Wednesdays, Oct. 14th, 21st, and 28th at 5 P.M.—Prof. K. Bühler, who occupies the chair of psychology in the University of Vienna, will give three lectures on the Theory of Language and the Psychology of Speech, at University College on dates in October to be announced later.—The Semon lecture will this year be delivered by Mr. Douglas Harmer, F.R.C.S., on Thursday, Nov. 5th, at 5 P.M., in the rooms of the Royal Society of Medicine, Wimpole-street, W. His subject will be the Relative Value of Radiotherapy in the Treatment of Cancer in the Upper Air Passages.

The *William Julius Mickle Fellowship*, of the value of at least £200, is offered to the graduate who has, in the opinion of the Senate, done most to advance medical art or science within the preceding five years. Applications must be made before Oct. 1st, and particulars are obtainable from the Academic Registrar.

Society of Apothecaries of London.

At recent examinations the following candidates were successful:—

Surgery.—K. W. Bruce, Univ. of Durham; G. B. Carter, Univ. of Manchester; M. Ditton, Univ. of Heidelberg and Royal Free Hosp.; A. A. Grace, St. Bart.'s Hosp.; B. N. Halder, Univ. of Durham; R. Schauder, King's Coll. Hosp.; and C. F. Williamson, Univ. of Birmingham.

Medicine.—H. W. Davies, St. Mary's Hosp.; G. R. Germany, Univ. of Sheffield; A. R. Madden, St. Mary's Hosp.; O. L. Matthews, Univ. Coll. Hosp.; and M. R. Tuteur-Samuel, Universities of Freiburg and Manchester.

Forensic Medicine.—O. A. P. Clark, Westminster Hosp.; R. R. Clipstein, St. Mary's Hosp.; G. Handelsman, Univ. of Witwatersrand and London Hosp.; O. L. Matthews, Univ. Coll. Hosp.; C. Morgan, Charing Cross Hosp.; M. S. Mules, Royal Free Hosp.; and Grantley Smith, Univ. of Bristol and Guy's Hosp.

Midwifery.—G. B. Carter, Univ. of Manchester; Sidney Smith, Univ. of Manchester; and V. M. White, London Hosp.

The following candidates, having completed the Final Examination, are granted the diploma of the Society entitling them to practise medicine, surgery, and midwifery: G. R. Germany, A. R. Madden, O. L. Matthews, R. Schauder, M. R. Tuteur-Samuel, and C. F. Williamson.

Scottish Conjoint Examining Board.

The final examinations of the Board of the Royal College of Physicians of Edinburgh, the Royal College of Surgeons of Edinburgh, and the Royal Faculty of Physicians and Surgeons of Glasgow, have just concluded at Edinburgh. Out of 91 candidates entered the following 29 have been granted the diplomas of L.R.C.P. Edin., L.R.C.S. Edin., L.R.F.P. & S. Glasg.:—

Genesis Ameratunga, Sirisena Petiyagoda, T. F. Kirkpatrick, H. J. Smith, H. T. Anthonisz, T. A. M. Ashforth, G. L. Whitton, C. F. W. de Saram, B. A. Armitage, M. W. Joseph, L. J. Goggins, R. J. F. L. Talbot, C. M. Douglas, G. W. Purlmannasinghem, S. R. Iyengar, Samuel Grasse, F. A. Ebert, A. M. C. Stephenson, I. M. Sclare, J. A. Walsh, Wilfred Kelly, Maxwell Smellie, S. V. Rajah, M. E. Rubin, A. G. Williams, G. D. Morgan, P. A. V. Pillai, H. F. Ezzat, and Simon Freeman.

Paddington Green Children's Hospital.

The Duke of Connaught last week opened a new convalescent home at Lightwater, near Bagshot, for this hospital. It has cost £5000.

NOTES, COMMENTS, AND ABSTRACTS

HEALTH IN WEST AFRICA.

THE latest vital statistics[1] of non-native officials in West Africa (comprising Gambia, Sierra Leone, Gold Coast, and Nigeria) show that the average number in the service has risen continuously from about 1200 in 1903 to over 4000 in 1930. At the same time the crude death-rate has fallen from 20 to 5·3 per 1000, the lowest point yet reached. The "invaliding"-rate shows a similar fall from 65 per 1000 in 1903 to 11 per 1000 in 1930. Of the 23 deaths in 1930 very few were due directly to tropical diseases, while of the 49 cases of invaliding five are attributed to malaria and one to blackwater fever. The largest group, numbering 11, are classified as neurasthenia, and the figures suggest that the risk of mental breakdown exceeds the risk of physical disablement from diseases peculiar to the tropics, and the environmental problems involved deserve attention. The form of the report has been somewhat altered from that of previous years. The data are now given separately for male and female officers, and new comparative tables have been introduced summarising the rates per 1000 of deaths and invalidings in each of the four territories over a period of 20 years. The difficulty in interpreting these tables, and in using the information relating to females, lies in the small numbers of persons involved. The improvement that has taken place in each territory and in the area as a whole would be far more clearly seen if standardised death-rates could be incorporated. The crude rates, however, suggest a vast improvement in the health conditions of the service during the last quarter of a century.

DIPHTHERIA IN A PARIS HOSPITAL.

IN a recent communication to the Academy of Medicine at Paris, Dr. B. Weill-Hallé[2] recorded his observations on diphtheria at the Hôpital des Enfants Malades in 1929 and 1930. A total of 1210 cases of diphtheria were admitted to the special pavilion at this hospital during this period, and 131 were fatal—a mortality of 10·8 per cent. Ninety-three deaths occurred among 1054 cases of faucial diphtheria (8·7 per cent. mortality), 31 deaths among the laryngeal or laryngo-tracheo-brachial cases (22 per cent.), and there were 7 deaths among 28 cases of paralysis. The mortality was almost the same in each of the two years, being 11 per cent. in 1929 and 10·6 per cent. in 1930. Comparing these figures with those which he reported from the same hospital in 1903, when he was Prof. Marfan's house physician, he shows that there has been a considerable fall in the incidence of diphtheria—mainly, he says, as the result of active immunisation—though the number of severe cases still remains high. This severity he attributes to various causes, such as virulence of the organisms, delay in diagnosis and specific treatment, association with seasonal infections and a special constitution, especially latent congenital syphilis. Although the treatment was the same in the two periods, the present dose of antitoxin was three to four times the amount used in 1901–02. He therefore concludes that diphtheria in 1929–30 was a less fatal disease than in 1901–02 and that diphtheria antitoxin had by no means lost any of its efficacy as some maintained. His present practice is to give an intramuscular injection of antitoxin on admission to hospital in order to neutralise the circulating toxin and at the same time to give a subcutaneous injection which is more slowly absorbed but continues to exercise its antitoxic effect during the following days. In apparently hopeless cases an intravenous injection is given half an hour after the other two injections, and during the next four or five days small doses of antitoxin are administered by the subcutaneous and intramuscular routes.

THE LIGHTING OF OFFICES.

WE noted last week (p. 258) some recommendations of the Council of the Illuminating Engineering Society on the lighting of schools and libraries. A pamphlet on the daylight illumination required in offices is published by the Department of Scientific and Industrial Research.[1] It might be thought that the adequacy of the natural lighting at any point in a room would depend solely upon the actual illumination at that point, so that a room which might seem light enough on a bright day would seem inadequately lighted on a dull day. Some time ago evidence was obtained that this is not so, but that, over a wide range of actual illumination values, the adequacy or inadequacy of the lighting at any given point is closely correlated with the daylight factor at that point. To study this point a "jury" of observers, including architects, illuminating engineers, and others, visited certain rooms in Whitehall and judged the adequacy of the lighting in different parts of the room. The result of the work was the conclusion that lighting in an office is adequate when the daylight factor equals or exceeds 0·2 per cent.—i.e., a sill ratio of 0·4 per cent. This is exactly the figure taken as a minimum of adequate lighting by the committee whose report was noticed last week.

GREAT MEN IN PUBLIC HEALTH.

YET another book[2] inspired by the names of the great sanitarians inscribed on the façade of the new School of Hygiene in Gower-street. There is, perhaps, more to be said than appears at first sight for such institutions giving on busy, noisy streets. Dr. Tobey does not restrict himself (as did M. E. M. Walker in his "Pioneers of Public Health"[3]) to the 21 selected heroes. He ranges over the whole history of public health, and writes accurately and interestingly of the progress of sanitary science from Moses to Gorgas and after. He goes to some extent off the track which has been beaten pretty hard in recent years, and those who are a little bored with Lister, Pasteur, and Florence Nightingale can turn for refreshment to the chapters on W. T. Sedgwick, Trudeau, and the mental hygienists. The book is beautifully produced (except for the binding).

ERRATA.—*In a report of a paper read before the Section of Pathology of the British Medical Association on July 22nd (p. 247) Dr. G. Roche Lynch is credited with a statement that "the employment of a non-medical analyst seriously embarrassed the work of highly skilled men." This misrepresents his meaning; for the point he wished to make was that faulty observation by the medical man at the post-mortem seriously embarrasses the work of the non-medical analyst.*

In an annotation, entitled Sympathetic Ganglion Lesions in Scleroderma, which appeared on p. 255 of our last issue, the name of Dr. Geoffrey Rake was incorrectly given. Dr. Rake, who was formerly resident at Guy's Hospital, is at present working at the Rockefeller Institute in New York.

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[1] West Africa: Vital Statistics of Non-native Officials. Returns for 1930. Published by the Crown Agents for the Colonies, Millbank, London, S.W. Pp. 7. 6*d*.

[2] Bull. de l'Acad. de Méd., 1931, CV., 971.

[1] Illumination Research Technical Paper, No. 12. H.M. Stationery Office. 1931. Pp. 10. 3*d*.

[2] Riders of the Plagues: the Story of the *Conquest of Disease*. By J. A. Tobey, Dr.P.H. New York: Scribner. 1930. Pp. 348. 9 plates. 12*s*. 6*d*.

See THE LANCET, 1930 ii., 671

ADDRESSES AND ORIGINAL ARTICLES

ON VACCINE THERAPY AND IMMUNISATION IN VITRO.

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(Concluded from p. 284.)

Specific and Non-specific Immunity.

It has already been indicated above that the terms "specific" and "non-specific" are terms of ambiguous signification. Let me justify this.

When we speak of "specific" immunising response, we may mean that infection or its equivalent—i.e., the inoculation of a vaccine—renders the blood bactericidal to the homologous microbes, and only to these; and when we attach this meaning to "specific immunising response" we should, of course, mean by "non-specific immunising response" the acquirement of bactericidal properties for heterologous, as well as homologous microbes.

We may, however, when we use the terms "specific" and "non-specific" be thinking not of the question as to whether immunising response gives protection against one or more varieties of microbes, but of the question as to whether the antibacterial substances brought into play operate "specifically"—each affecting only one species of microbe, or whether they operate "non-specifically"—each affecting more than one species.

Having realised that the terms "specific" and "non-specific" are terms which carry these two distinct meanings, it will avoid confusion if we call the thesis that infection and vaccination immunise only against homologous microbes: "*the doctrine of purely homologous immunising response,*" and the antithetic thesis that protection is acquired also against heterologous microbes: "*the doctrine of conjointly homologous and heterologous immunising response.*" Similarly, we should do well to call the thesis that there are special antibacterial substances for each kind of microbe: "*the doctrine of specific antibodies*"; and the antithetic thesis that there are antibacterial substances which operate upon more than one kind of microbe: "*the doctrine of non-specific antibodies.*"

IS THE IMMUNISING RESPONSE SPECIFIC?

Having clarified the issues we may now make inquiry from the facts, first, as to whether immunising response is specific or non-specific, and secondly, as to whether the antibodies which are native to the blood or are engendered there by infection and vaccination, are specific or non-specific. The answer to the former question is given in many of the protocols of immunisation in vitro already adduced or to be adduced later, as well as in numerous others published and unpublished. A study of the protocols referred to shows that Tuberculin B.E. gives immunising response upon staphylococcus; that staphylococcus vaccine gives immunising response upon streptococcus, and typhoid vaccine operates in the same way upon staphylococcus. Further, it would seem—at any rate in the case of my own blood—that better immunising response is obtained upon staphylococcus with Tuberculin B.E. than with staphylococcus vaccine. I shall presently have something to say with respect to this last finding.

When we pass from immunising operations in vitro to immunising operations in vivo we again find clear evidence of "non-specific"—i.e., heterologous response. Fig. 4 gives a very convincing example of response obtained upon staphylococcus by an intravenous inoculation of a coliform vaccine. We have here first a negative phase of diminished, and then a positive phase of increased hæmo-bactericidal action exerted upon the staphylococcus.

And let me, in this connexion, call attention to two points. The first is a question of terminology. It relates to the fact that severe and rapidly supervening constitutional symptoms, such as follow intravenous inoculation, and followed it here, are in the current jargon of medicine, designated "protein shock." This terminology is to be deprecated because there attach to this term quite erroneous implications. (1) The term suggests that in the case where vaccines produce protein shock this is produced by active agents other than those which produce ordinary immunising response. (2) The term further suggests—for it is employed only in connexion with intravenous injections—that protein shock is produced only by intravenous inoculations. Those who have administered large doses of typhoid vaccine hypodermically, and have witnessed the resulting supervention of shock in patients, and in particular in patients who have immediately after inoculation engaged in active exercise, will not require to be told that shock can follow when a severely toxic dose of a vaccine given by the subcutaneous channel has been carried into the circulating blood. Another vice of the term "protein shock" lies in its assimilating intravenous inoculations of vaccine to intravenous inoculations of milk, foreign serum, and such like, in lieu of assimilating these injections of foreign albuminous substances to inoculations of vaccine. And an even more serious vice is that the term "protein shock" carries with it the suggestion that non-specific immunising response is a product peculiar to intravenous injections of foreign proteins when it is, in point of fact, a general property of vaccines.

A final point to which I want to draw attention relates to the leucocytic counts inserted at the foot of *Fig.* 4. These figures illustrate the point that inoculations of vaccine, and in particular, severe inoculations, such as that here in question, are followed by a phase of leucopenia, followed by a phase of leucocytosis; and the figures are inserted here to bring out the point that the increased bactericidal effect shown in the fourth compartment of the slide cell is achieved quite independently of any leucocytosis.

Immunising response in vivo is, I need now hardly say, not confined to the case of coliform vaccines. We have evidence that streptococcus gives immunising response in vivo upon staphylococcus, and similarly, staphylococcus vaccine upon streptococcus. And these are results obtained by measurements of phagocytic and of sero-bactericidal response—in other words, measurements which cannot be falsified by variations in the number of circulating leucocytes. Let me defer for a moment what I have to say about the importance of these findings for vaccine therapy.

For there can be set off against the protocols of experiments showing non-specific immunising response others which favour the idea that immunising response is specific. I am thinking here of the experiments set out in Charts 32 and 44[15] reproduced in my "Studies on Immunisation" (pp. 418 and 425), and I have in view also some unpublished experiments, and among these a peculiarly striking one made by Dr. John Freeman. In the experiments in question (they were, in each case, massage experiments) the patients' bloods were tested to two microbes (in Dr. Freeman's case the blood was tested to five), and immunising response was obtained in each case only to that microbe which was from the clinical and bacteriological evidence adjudged to be causally associated with the patient's malady. But obviously, we have no reason to suppose that every species of microbe can immunise against every other species.

ARE THE ANTIBODIES SPECIFIC ?

The study of the question as to whether the antibodies which are native to the blood and also those engendered by inoculation operate upon one kind of microbe to the exclusion of all others has, for the immunisator, only a subordinate interest. A few points may, however, here be referred to. W. Bulloch and G. T. Western,[16] dealing with antibodies native to the blood, found that the opsonins which operate upon the tubercle bacillus can be removed from the serum without removing the opsonins for staphylococcus and vice versa. They found, further, that the opsonin for staphylococcus can be removed without removing the opsonin for the *Bacillus pyocyaneus*. On the other hand, it has been shown (the data will be found in my "Studies on Immunisation," pp. 50 and 51) that treatment of the serum with dead cultures of typhoid and cholera extracts the bactericidins for both species of microbe.

Let me now supplement the points already brought forward by one more. The work of Shattock and Dudgeon—it was, it will be remembered, carried out with melanin particles—suggested that "phagocytic avidity" was non-specific. This conclusion is confirmed by the observations of my sometime fellow-worker, Dr. R. Hare, dealing with the bloods of cases of puerperal septicæmia. These observations show that increased and diminished phagocytic avidity to streptococcus goes hand in hand with increased and diminished phagocytic avidity to staphylococcus.

GENERAL CONCLUSIONS.

I should now like to set out the conclusions which seem to me to follow from the data which we have been considering.

Doubtless it seemed paradoxical, and, therefore, doubtful and unacceptable, when I said that when I operate upon my blood with a tubercle vaccine (B.E.) I get better—that is, more emphatic, and for the same dose employed more consistent—immunising response than when I operate with staphylococcus vaccine. In connexion with it I am not going to be rash enough to suggest that the reader should abate anything of his faith in its being a general law of nature for the best immunising response to be obtained by the use of a homologous vaccine. I do not want to do anything more than suggest that a rule such as this might quite well be open to exception. It might be open to a general exception if the heterologous vaccine in question were, as compared with the homologous vaccine, more easily soluble in the blood fluids. And it might be open to an individual exception if a particular patient's blood exerted less lytic action upon a vaccine made with his own microbe than it did upon a vaccine made from a microbe other than the infecting microbe.

Anyone who goes as far as to accept the possibility of such exceptions to rule will be prepared to let the superiority of a vaccine A over a vaccine B—even if the vaccine A should be heterologous and the vaccine B homologous—be decided by laboratory experiment and, moreover, will be prepared to look upon such experiments without parti pris. But while I would plead that the question of superiority of one kind of vaccine over another is one that can be settled only by experiment, none the less I want to put two general points. They are the following:—

In cases where the nature of the infecting agent cannot be determined, advantage very often accrues from inoculation with vaccines made from microbes which are, in all probability, different from those with which the patient is infected. When I say this I have in view (well knowing that these and all other bacteriologically undiagnosed affections are of debatable ætiology) articular rheumatism and phlyctenules of the cornea. It would, I think, sheer obstinacy to let doubt respecting the ætiology of these affections and a passionate conviction that immunising response is purely specific, hold us back from inoculating in the one case vaccines made from intestinal streptococci, and in the other case minimal doses of Tuberculin B.E. Essentially the same reasoning would, I think, apply in dealing with infections such as glanders, in which homologous vaccines have been tried time and again without success. One might, I think, surmise that such a microbe as that of glanders furnished a very ineffective antigen, and one might, by consequence, reasonably try whether anything useful could be done with a non-homologous vaccine.

Principles of Dosage.

I turn now—and this will complete what I propose to say here on the subject of vaccine therapy—to the question as to whether we can, with the knowledge gained by the study of immunisation in vitro, add anything to the principles of dosage which were learned when we had only the clinical symptoms and measurements of the opsonic index to guide us. It will be remembered that the most important of the general principles of dosage arrived at by watching and measuring the opsonic index of patients was that the doses of vaccine employed should be inversely as the amount of infection. Further, that, with a view to avoiding negative phases, the doses given to heavily infected patients should be much smaller than those given to the lightly infected, and should represent a very small fraction of the doses administered in prophylactic operations undertaken upon the healthy. This principle finds interesting confirmation when we carry out experiments in vitro. We take a series of equal measured blood volumes and implant into these graduated quanta of living microbes, and then add to each implanted volume one and the same dose of vaccine. It does not require a great effort of imaginative vision to discern that we have here analogous conditions to those which prevail in lightly and heavily infected patients. Instructive illustration of the effects produced is furnished in the subjoined protocols.

Expt.—Capillary tubes were prepared with a stem about a foot and a half in length and of almost uniform bore, and a 10 c.mm. division mark was then placed on the distal end of the stem. Blood was then obtained from my finger, and then there was aspirated into one of the capillary tubes as a forerunner 10 c.mm. of a 1000-fold dilution of a broth culture of staphylococcus; and then, as after runners, ten 10 c.mm. volumes of blood. The same procedure was carried out with two other portions of blood, the one inoculated with a smaller and the other with a larger dose of Tuberculin B.E. After 24 hours' incubation the blood-clots were blown out in order, each series arranged in a row upon a separate strip of filter paper. The clots were then, as soon as they had by absorption of fluid become adherent to the filter paper strips, treated with 1 per cent. saponin, and the strips were then introduced into a beaker full of water, being applied to its interior wall after the fashion of a cornice. When hæmolysis was complete the filter paper strips were placed in a Petri dish containing water, and the decolorised clots were then aspirated into a capillary tube and transferred in proper order to a microscopic slide. They were then dried and stained. The number of colonies which developed in each of the three series of clots is set out in Table XX.

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[15] These charts should, however, be studied in conjunction with Charts 7 and 8, pp. 387 and 388, loc. cit.

[16] Proc. Roy. Soc. B, 1906, lxxvii.; reprinted in my Studies on Immunisation, pp. 180–185.

TABLE XX.

—	No. of colonies of staphylococcus in volumes.										No. of colonies in—		
	1	2	3	4	5	6	7	8	9	10	The whole 10 vols.	Vols. 1–5	Vols. 6–10
Control blood ..	1	9	5	2	1	2	1	1	0	0	22	18	4
Blood inoculated with B.E. 1 in 1000 million ..	1	3	4	1	2	0	2	0	0	0	13	11	2
Blood inoculated with B.E. 1 in 500 million ..	4	10	9	15	3	1	0	0	0	0	42	41	1

Note.—The small number of colonies in Vols. No. 1 is no doubt due to this volume of blood being very highly diluted by the forerunner volume of tuberculin in salt solution.

When we glance, to begin with, at the rubric in which are set down the aggregate number of staphylococcic colonies which developed in the three capillary tubes, we see that the aggregate is, in the case of the blood containing 1 part of B.E. in 1000 million, less by nearly 50 per cent. than it is in the control blood, and that the aggregate number of colonies which developed in the blood which contained 1 part of B.E. in 500 million is nearly double that in the control. If demonstration were necessary of the impossibility of judging a dose of vaccine by the epitomal result produced upon a series of different bloods of patients, such demonstration is furnished here. For, judged by the epitomal effect produced in the whole series of volumes, a dose of 1 part in 500 millions of tuberculin is a large overdose for my blood. Very different are the conclusions which emerge when we analyse the results and consider separately that which applies to the first five and that which applies to the last five volumes of the series. We then see that in the case of the heavily implanted blood volumes the effect of the larger dose of vaccine is to give us in these volumes more than twice as many colonies as in the control blood, and nearly four times as many as in the less heavily vaccinated blood. But when we turn to the effect produced upon the more lightly implanted bloods we see that the larger dose of vaccine enhances the bactericidal power more than does the smaller dose.

An essential similar experiment is Table XXI.

Expt. 8.4.31.—Same technique. Forerunner 15 c.mm. volumes of $\frac{\text{staph.}}{1000}$; afterrunners, ten 15 c.mm. volumes of A. E. W.'S blood.

TABLE XXI.

—	No. of staphylo-lococcus colonies in volumes.*								Whole 8 vols.		1st 4 of those vols.		2nd 4 of those vols.	
	3	4	5	6	7	8	9	10						
Control—														
Unvaccinated blood	24	16	9	3	0	0	1	1	54	50	52	47¼	2	2½
	29	12	2	3	0	0	0	0	46		46		0	
	20	9	20	0	4	1	0	0	54		49		5	
	29	7	3	3	0	3	0	0	45		42		3	
Blood vacc. with—														
$\frac{\text{B.E.}}{\text{1000 million}}$ ..	2	0	2	1	0	1	0	0	6		5		1	
$\frac{\text{B.E.}}{\text{500 million}}$ ..	11	8	5	0	1	0	0	0	25		24		1	
2000 killed staph.	15	4	6	2	0	0	1	0	28		27		1	
4000 " "	23	14	14	14	4	0	0	0	69		65		4	

* Nos. 1 and 2 nil. Staph. = staphylococci.

Increased Phagocytosis Obtained by Inoculation of Blood in vitro.

Precisely similar effects—and effects which show that we are here dealing with a general law—are seen in phagocytic experiments in which an inoculated blood is tested with progressive dilutions of a staphylococcus culture.

Phagocytic Expt.—A. E. W.'s blood centrifugalised with different strengths of Tuberculin B.E. and different strengths of staphylococcus vaccine. (Table XXII.)

TABLE XXII.

—	Phagocytic indices tested with—	
	5-fold diluted sterilised culture.	15-fold diluted sterilised culture.
Control blood	1·0	1·0
Blood with— $\frac{\text{B.E.}}{\text{1000 million}}$	0·76	1·63
$\frac{\text{B.E.}}{\text{200 million}}$	0·66	1·0

No preliminary incubation.

Phagocytic Expt.—A. E. W.'s defibrinated blood mixed with different strengths of Tuberculin B.E. and different dilutions of staphylococcus and then centrifugalised immediately after mixture. (Table XXIII.)

TABLE XXIII.

—	Phagocytic indices tested with—			
	Undiluted culture.	3-fold dilution.	9-fold dilution.	27-fold dilution.
Control blood ..	1·0	1·0	1·0	1·0
Blood with— $\frac{\text{B.E.}}{\text{1000 million}}$ ..	1·5	2·45	1·65	1·2
$\frac{\text{B.E.}}{\text{5000 million}}$ ..	1·4	1·0	1·0	0·96

Phagocytic Expt.—A. E. W.'s defibrinated blood implanted with Tuberculin B.E. and centrifugalised immediately after mixture with progressive dilutions of staphylococcus. Where the higher dilutions of staphylococcus were employed the length of centrifugalisation was increased in order to obtain a conveniently large ingest. (Table XXIV.)

TABLE XXIV.

—	Phagocytic indices tested with—			
	An undiluted culture.	3-fold dilution of the culture.	9-fold dilution of the culture.	27-fold dilution of the culture.
Control blood ..	1·0	1·0	1·0	1·0
Blood with $\frac{\text{B.E.}}{\text{1000 mill.}}$	1·05	1·1	1·35	1·4
Duration of centrifugalisation ..	½ min.	1 min.	2 min.	2 min.

The rationale of these results is obvious. They show us that when the blood is implanted with a moderate quantum of living microbes and a moderate quantum of vaccine is added, the antigens derived from these twin sources may constitute, taken together, an optimum immunising stimulus. They show us further that when the implant of living microbes is cut down, and the antigen derived from this source is correspondingly diminished, the quantum of vaccine may be profitably increased. And vice versa when the implant of living microbes is increased the quantum of vaccine must be correspondingly cut down.

Before leaving this question a word may be said concerning the situation in which we find ourselves when dealing with a patient who has an acute infection, and we are in doubt as to whether he can still make response to a vaccine, and if so as to what quantum can be safely administered. In this situation we can, by recourse to what I have called the Vaccine Response Test[17] obtain the required information.

The "*Vaccine Response Test*" consists in adding to the patient's blood in vitro graduated quanta of the vaccine which it is proposed to use, and seeing whether any of the doses employed enhance, after some arbitrarily fixed period of incubation, the phagocytic power of the patient's blood, or whether all doses of vaccine impair that power.

I have elsewhere[18] published data showing the help that can be obtained from the vaccine response test. But I should like to say here that when in a rapidly advancing infection we needs must decide in the dark, it is always advisable to try the effect of inoculating with a very small dose of vaccine. For the advantage that may accrue if the patient's blood is still capable of making immunising response far outweighs the harm that might result if his were incapable of making immunising response, and the case already hopeless.

Let me now come back from this digression and consider yet another question in connexion with the dosage of vaccines. I can best introduce the point by recalling that while in the case of ordinary vaccines some of the antigen is in solution, the bulk of it is present in the form of particulate matter which is (I am thinking here in particular of vaccines made from serophytic microbes) not very readily soluble in the blood fluids. It follows that if there is, when the vaccine comes into operation upon the blood, any immediate immunising response, this will be response to that fraction of the total antigen which is in solution in the vaccine, or is, as the case may be, immediately brought into solution by the blood fluids. Such subitaneous response takes in the typical curve of opsonic response (figured in my "Studies of Immunisation," p. 379, Chart I), the form which I there called a "false rise," and this

Phagocytic Expt.—A. E. W.'s defibrinated blood treated with staphylococcus vaccine and tested with staphylococcus by the method of centrifugalisation at intervals after vaccination. (Table XXV.)

TABLE XXV.

—	Phagocytic indices.		
	Immediate result.	After 1 hr. 45 min. on bench.	After a further 45 min. at 37° C.
Control blood	1·0	1·0	1·0
Blood inoculated with 10,000 dead staph. per c.cm.	1·23	0·55	0·18
Blood inoculated with 5 million dead staph. per c.cm.	1·33	0·77	0·31

Phagocytic Expt.—A. E. W.'s defibrinated blood vaccinated with Tuberculin B.E., and tested at intervals after vaccination by centrifugalisation with staphylococcus. (Table XXVI.)

TABLE XXVI.

—	Phagocytic indices.	
	Tested immediately after vaccination.	After 1 hr. 20 min. incubation.
Control blood	1·0	1·0
Blood inoculated with—		
B.E./1000 million	1·5	0·6
B.E./200 million	0·57	0·7
B.E./10 million	0·53	0·7

Phagocytic Expt. 22.10.25.—A. E. W.'s blood and the same blood treated with two strengths of Tuberculin B.E. Tested phagocytically by centrifugalisation with staphylococcus at different intervals after vaccination (Table XXVII.)

TABLE XXVII.

—	Phagocytic indices.					
	5 min.	10 min.	20 min.	40 min.	90 min.	140 min.
Control blood	1·0	1·0	1·0	1·0	1·0	1·0
Blood inoculated with—						
B.E./1000 million	0·82	0·94	1·0	1·15	1·63	1·6
B.E./50 million	0·6	0·56	1·0	0·8	0·76	0·56

Expt. 23.10.27.—A. F.'s defibrinated blood implanted with Tuberculin B.E. and kept in the incubator and tested at progressive intervals after vaccination by centrifugalisation with staphylococcus. (Table XXVIII.)

TABLE XXVIII.

—	Phagocytic indices.			
	5 min.	10 min.	1 hr.	1 hr. 20 min.
Control blood ..	1·0	1·0	1·0	1·0
Blood inoculated with—				
B.E./500 million ..	0·89	0·86	1·53	1·64
B.E./5 million ..	1·25	1·1	1·25	1·0

Expt. (*undated*).—A. F.'s defibrinated blood incubated with Tuberculin B.E. and tested at progressive intervals after vaccination by centrifugalisation with staphylococcus. (Table XXIX.)

TABLE XXIX.

—	Phagocytic indices.				
	10 min.	14 min.	20 min.	25 min.	30 min.
Control blood ..	1·0	1·0	1·0	1·0	1·0
Blood with B.E./300 million	1·46	1·47	1·31	1·30	0·90

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[17] THE LANCET, 1923, i., 473.

[18] Ibid., p. 475, 1923.

"false rise" is, according as the quantum of antigen afterwards dissolved is appropriate or excessive, followed by either a positive phase unpreceded by a negative, or a negative phase followed by a positive. All this is very clearly shown in the subjoined series of protocols.

There remains one last point which I should like to call attention to. It is again a point of similarity between the effects produced by infection in vivo and those produced by inoculation in vitro. It will perhaps be remembered that I have from the very outset called attention to the fact that patients suffering from lupus and generally from strictly localised forms of tuberculosis,[19] unaccompanied by constitutional disturbance, have a very low opsonic index to tubercle.

The phenomenon is clearly not one of the same order as the negative phase. For negative phases supervene, not upon minimal auto-inoculations, such as can here come in question, but only upon large inoculations or auto-inoculations. Further, a negative phase is practically always followed by the response in the form of a positive phase, and the indices of these patients remain, as can be inferred from the fact that their tuberculo-opsonic indices are uniformly low, chronically below standard. Every one of these points finds its parallel in the results obtained by the inoculation of the blood with minimal quanta of vaccine.

It has already been seen in one of the protocols of hæmobactericidal experiments which I have shown—and I could have very easily produced others showing the same—that when minimal quanta of living microbes are implanted into the blood on the one hand and serum on the other, more microbes develop into colonies in the blood than in the serum. The same thing may be seen when the sera of bloods which have been treated with minimal quanta of vaccines are tested for bactericidal power by implantation with staphylococcus. Such sera are very often found to furnish a better culture medium for staphylococcus than the control sera. And again, the addition of minimal quanta of vaccine to a phagocytic mixture often lowers the phagocytic index.

In conclusion, I have to express my gratitude to my fellow-workers, and in particular Prof. A. Fleming, Dr. Leonard Colebrook, Dr. R. M. Fry, and Dr. R. Mummery, for having very generously placed not only their work, but also their ideas at my disposal.

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[19] The data relating to this question and also important confirmation of these data by Prof. W. Bulloch are to be found in my Studies of Immunisation. (pp. 118, 152, and 146–148).

PROPOSED COMPLETION OF KING'S COLLEGE HOSPITAL.—The authorities of this hospital, in view of the powers conferred by the Local Government Act of 1929 upon county councils, have invited the London County Council to discuss with them the purposes to which the completion of the building might be devoted. In view of the desirability of providing maternity beds, it is suggested that further accommodation of this kind might be supplied in association with the council, whose survey of the hospital needs of its area showed that at least another 1000 beds were needed in South London, many of them maternity beds.

GORHAMBURY AS A TEMPORARY MENTAL HOSPITAL.—The Earl of Verulam's seat, Gorhambury, St. Albans, has been taken on lease by the Middlesex county council as a temporary mental hospital. The lease, which includes 18 acres of surrounding land, is to run for from five to seven years pending the completion of the new hospital at Porter's Park. The council will spend a maximum of £10,000 in adapting and equipping the house to accommodate 150 patients. The first section of the Porter's Park scheme (1000 patients) will cost £520,336.

THE PULMONARY ARTERY IMPRESSION ON THE ŒSOPHAGUS.

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AND

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ASSISTANT PHYSICIAN TO THE MIDDLESEX HOSPITAL.

(WITH ILLUSTRATIVE PLATE.)

WHEN a thick suspension of barium sulphate is swallowed, an observer may see by radioscopy the whole course of the œsophagus, which is, in a special sense, visualised. The procedure is so simple, and the anatomical relations are so favourable, that for years cases of dysphagia have been investigated in this way. It is an obvious method to employ in disease of the œsophagus itself (cardiospasm, simple stricture, and carcinoma), and in conditions which may produce pressure upon it (aneurysm and intrathoracic neoplasm). Though its use in patients with thoracic aneurysm is subsidiary to inspection and radiography of the aorta and the sac itself, yet barium in the œsophagus often helps to define the swelling and to localise it.

Radiology was first applied to the diagnosis of cardiac disease long before the war, but till recently it has been little used in this country as part of the systematic examination. Yet it could be maintained that it gives as much useful information—taking a large consecutive series of patients—as electrocardiography.

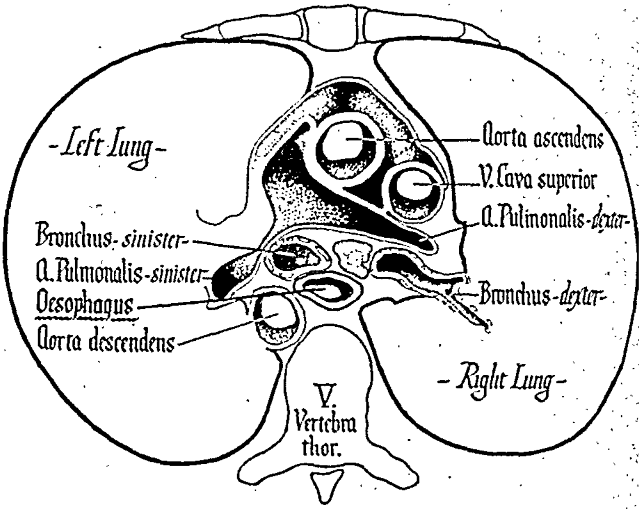
Apart from the matter of aneurysm, the relation of the œsophagus to the aorta has been used as a means of measuring the diameter of the aorta in normal and pathological states. As the arch of the aorta passes backwards and to the left to reach the spine, its wall touches the œsophagus. The relation is so close that on the barium-filled œsophagus appears an impression which is called by Kreuzfuchs[4] the aortic bed. He made use of the fact in measuring from the middle of this impression or bed transversely across to the most lateral point of the aortic knuckle to obtain the diameter of the aortic arch (Fig. IV.). This natural impression by the aorta on the œsophagus is also visible in the first oblique position—i.e., with the patient turned *half-left*. The opaque bolus is momentarily held up at this level, for there is not only displacement, but constriction (Fig. XII.).

The second current application of the visualised œsophagus to cardiac diagnosis is the displacement produced by the enlarged left auricle in mitral stenosis. The worth of this almost pathognomonic sign of mitral stenosis has not even yet been realised. It is seen better in the first oblique position (patient facing half-left) than in the anterior (Fig. X.).

Still other conditions have been studied by observing their effect upon the œsophagus. There is a congenital anomaly of the aorta in which the aortic arch passes over the right bronchus instead of the left (right-sided aortic arch); here the œsophagus presents a convexity to the left. In this condition there may be a diverticulum of the aorta behind the œsophagus (persistent left aortic root), giving rise to the left subclavian and ductus arteriosus; or the aorta after passing over the right bronchus may cross to the right behind the œsophagus, displacing it forwards and to the left. When the left subclavian takes an aberrant course behind the œsophagus, dysphagia may result (dysphagia lusoria), and there may be a diagnostic dent on the barium-filled œsophagus. A similar dysphagia may be produced when the aortic arch is normally situated on the left, by an aberrant right subclavian artery running behind the œsophagus.

In making routine examinations by radioscopy in the first oblique position, we have noticed another impression on the œsophagus, one which seems to have escaped attention. It lies between the two impressions already mentioned, the aortic above and the auricular below, forming a sort of "middle arc" in the first oblique view of the heart. In some degree it is often seen in healthy persons, but it is modified or exaggerated in certain diseases, particularly, we think, in those associated with enlargement of the pulmonary artery and its branches.

FIG. I.



Transverse section of the normal thorax at the level of the fifth thorac vertebra (specially drawn after Eycleshymer and Shoemaker, 1911 The relation of the pulmonary artery and its right branch to the le bronchus and to the œsophagus is shown.

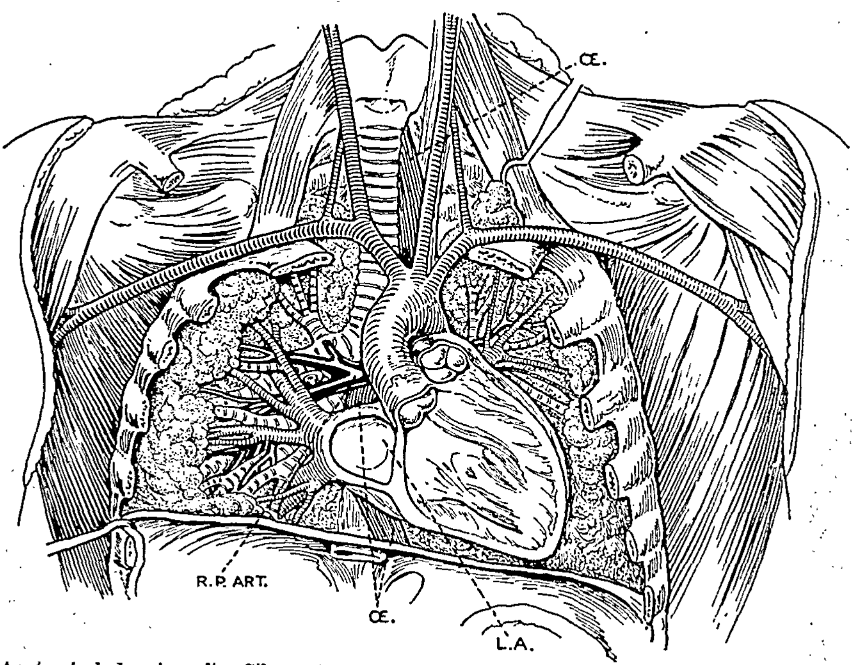
Course and Calibre of the Œsophagus in the Thorax.

Viewed from the front, the œsophagus does not run vertically downwards, but inclines to the left of the middle line from the neck to the fourth thoracic vertebra, there to regain the middle line or even to bear to the right of it where the aortic arch is passing on its left. Below this it often takes another gentle curve to the left, which becomes accentuated in the lower portion, where it crosses in front of the descending aorta. In old people with atheroma of th descending aorta, the lower curve of the œsophagu to the left may be pronounced. During inspiration a in a long chest the œsophagus tends to be straighte than during expiration *or in a short chest*, or where th diaphragm is high.[2]

Viewed from the side, the œsophagus as a whol shows a long, slight curve backwards behind th aortic arch and the heart. It is applied to them muc more intimately than to the spine or to the descendin aorta, which so closely follows the spine. In fact from the fifth thoraci vertebra the œsophagu leaves the spine and lie closely on the back o the heart. In kyphosis, for instance, it does not adhere to the bent spine but to the heart, thus taking a more direct course. It is noteworthy that the œsophagus is only firmly fixed at the pharynx and the diaphragm; nowhere else in its course are there firm attachments, so that it is easily displaced by adjacent swellings.

Much has been written on the natural constrictions of the œsophagus, chiefly from the anatomatical and surgical aspects. Admitting the relative narrowing at its origin, at its passage through the diaphragm, and at its termination in the stomach, we think that constrictions described in its intrathoracic course may be of a different nature. Two are described—one where the aortic arch abuts on it; the other where the left bronchus crosses

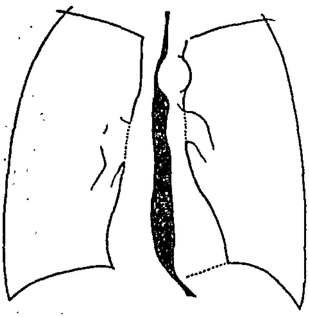
FIG. II.



Anatomical drawing after Sibson (Medical Anatomy, London, 1869, Plate VI.). Anterior view after removal of the right auricle and right ventricle. The course of the œsophagus (Œ.) is shown in relation to the arch of the aorta, the bifurcation of the trachea, the right pulmonary artery (R.P. Art.), and the left auricle.

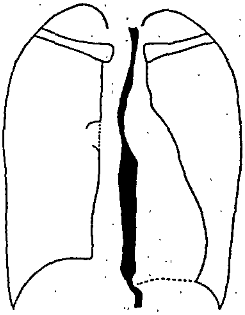
it obliquely. From the radiological aspect these are natural *compression* stenoses, for there is narrowing as well as deviation. There is not only an aortic bed, but also a left bronchial bed.[5] These are grooves on the œsophagus which determine at once the cause and site of the constrictions.

FIG. IV.



Outline of teleradiogram (anterior view) from a healthy man, aged 61, to show the aortic bed on the barium-filled œsophagus, and also the slighter pulmonary artery impression at the level of the dividing pulmonary artery—i.e., of the hilar branches.

FIG. V.

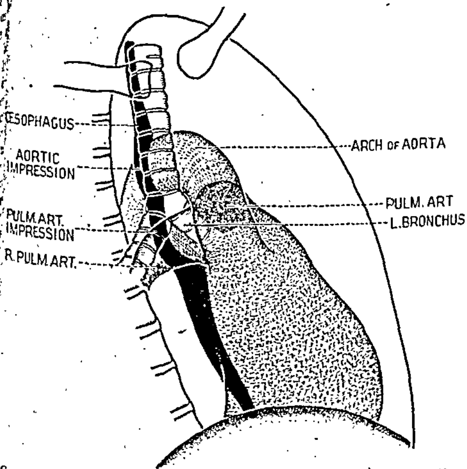


Outline of teleradiogram (anterior view) from a woman, aged 30, with congenital heart disease. It shows a slight impression on the œsophagus from the small aorta and below it a larger impression due to the larger pulmonary artery.

Relations of the Œsophagus to the Heart and Great Vessels.

The arch of the aorta passes backwards, then downwards and to the left or reach the spine at the fourth thoracic vertebræ, whereafter it continues as the descending aorta. The arch crosses in front of and then passes backwards on the left of the œsophagus, which it touches. The œsophagus lies behind and a little to the left of the trachea. Opposite the fourth vertebra the aorta pushes it to the middle line. At the tracheal bifurcation, facing the fifth vertebra, the œsophagus has again returned to the left, so that it is more in contact with the left bronchus than the right. In the angle of the bifurcation is a group of glands, but immediately below this the right pulmonary artery, running transversely within the pericardium, is in direct anterior relation to the œsophagus (Figs. I. and II.). We have confirmed this relation in the cadaver. If a sound is placed in the œsophagus, a finger passed through the cut pulmonary artery into its right branch comes into close contact with the sound. In the cross-section it will be seen that the main trunk of the pulmonary artery arches and divides at this level in close proximity to the œsophagus, though less directly in anterior relation. Thus below the aortic arch there is a segment of the œsophagus in contact with the left bronchus and the right pulmonary artery, and under the influence of the adjacent pulmonary stem (Fig. III.). Below this middle segment—which is under our consideration—the œsophagus lies behind the left auricle, round which it curves before piercing the diaphragm.

FIG. III.



Composite teleradiogram, semi-diagrammatic, showing the normal relations in the first oblique position (patient *half-turned left*). As the aortic arch passes backwards, it grooves the œsophagus, producing the upper or aortic impression. Below this is the "pulmonary artery impression," or middle curve, due to the pressure of the left bronchus, the right pulmonary artery, and the main pulmonary stem upon the œsophagus at this level. The lower or left auricular curve on the œsophagus is slight.

Posteriorly, the œsophagus lies loosely on the vertebral column, until it comes forward from about the fifth vertebra to cross the descending aorta so as to lie in front and on its left in their separate passage through the diaphragm.

The Pulmonary Artery Impression in Health.

There is an uncharted portion of the normal œsophagus, as seen by radioscopy and in radiograms after the ingestion of barium, between the aortic impression above and the left auricular impression below. This segment, as already described, is related to the left bronchus and right pulmonary artery, and adjacent to the pulmonary arch itself. We have investigated it radiologically—chiefly in the first oblique position—by inspection after giving the subject several spoonfuls of a thick paste of barium sulphate—e.g., citobaryum with a little water—and then by teleradiograms (6 ft.) taken directly after inspection.

This middle segment is about 2–4 cm. in length, and is best identified by its nearness to the lucent triangle, due to the left bronchus, which separates it from the dense shadow of the dividing pulmonary artery in front. It varies in prominence according to the degree of rotation of the subject. The optimum position is found empirically, usually at about 45°. Often quite straight, it as often occurs as a slight curve backwards, or at least as an impression on the anterior border. Then we see the barium-filled œsophagus built of three backward curves; from above downwards: (1) the aortic impression, (2) the "pulmonary artery" impression, and (3) the left auricular impression (Fig. VI.). Sometimes (1) and (2) are combined forming a single vascular curve above the left auricular curve (Fig. X.). Where this obtains, and there are two curves in all, it is usually evident that the upper curve is larger and extends lower than could be accounted for by the aorta alone. If necessary, this can be proved by comparison with the anterior or the second oblique position. It is surprising in normal individuals how slight, almost non-existent, may be the lowest curve—i.e., that adjacent to the normal left auricle. This renders all the more noticeable the middle curve, or the combined upper and middle curve.

Even on the anterior view a slight modification of the course of the œsophagus is occasionally discerned below the aortic bed (Fig. IV.), and measurements show that it corresponds in position with the middle curve described on the lateral view. Kreuzfuchs[5] ascribes the inclination below the aortic bed simply to the return of the œsophagus to its vertical course, and, incidentally, refers to the slight effect of the left bronchus upon its lumen.

In the second oblique position (patient facing half-right) a slight aortic impression is generally visible after barium, and below it is occasionally seen a slight impression again corresponding in position with the curve we describe (Fig. VII.).

The Pulmonary Artery Impression in Disease.

Although the "pulmonary artery" curve is often seen in conditions where there is no clinical reason for thinking that the pulmonary artery is abnormal, we find it more pronounced in conditions where the symptoms or the nature of the disease lead one to expect dilatation or engorgement of the pulmonary artery and its branches. This exaggerated pulmonary impression on the œsophagus is produced partly by direct imprint of the swollen right pulmonary artery, and partly by the left bronchus pressed against the œsophagus by the distended pulmonary stem.

An enlargement of the pulmonary arc will often have been noticed at the anterior view. By rotation of the patient to his left, on giving barium it is quickly seen that the middle curve on the œsophagus corresponds in level to the arc of the enlarged pulmonary artery. In particular, this middle curve of the œsophagus begins at the level of the summit of the pulmonary arch, much as the upper (aortic) curve of the œsophagus begins at the level of the summit of the aortic arch (Figs. VI. and XII.).

Where the aorta is lengthened from atheroma and rises in the chest high above the pulmonary arch, the latter is well seen as a dense shadow in apposition to a long, if shallow, middle curve on the œsophagus (Fig. VIII.). In a case of right-sided aortic arch, in which the œsophagus was displaced, Renander[6] found that the pulmonary artery made an impression on it.

As in the normal subject, the pulmonary artery or middle curve may be separate (Fig. XII.) or it may be combined with the aortic or upper curve (Fig. X.). The combined curve has often been taken as the aortic impression only, its undue length or curvature not being noticed. It is easily identified by placing the finger on the screen opposite the part of the curve in question, and turning the patient from the first oblique into the anterior position. It will then be found that the upper portion of the combined curve corresponds in level to the aortic knuckle, and the lower portion to the pulmonary artery at the lung roots. Where the aortic and pulmonary curves are separate they may, of course, be identified by the same plan. Occasionally, the pulmonary curve fuses with the auricular curve, producing a combined middle and lower curve.

Among the several conditions in which the pulmonary artery may be enlarged can be mentioned congenital heart disease, mitral stenosis, emphysema, goitre, and aneurysm of the pulmonary artery.

In many congenital malformations of the heart the pulmonary artery is enlarged, though by no means in all. It is, perhaps, commonest in association with patent ductus arteriosus. In general the size of the pulmonary artery varies inversely with that of the aorta; certainly when it is large the aorta is usually small. This fact is supported by our findings with the barium method, and in Fig. IX. the middle or pulmonary curve is seen to be longer and more noticeable than the upper or aortic curve. At the same time the lower or auricular curve is slight, for the left auricle is not affected (cf. mitral stenosis, e.g. Fig. X.). Not only in the first oblique position, but also in the anterior, the pulmonary artery impression may be pronounced in congenital disease (Fig. V.).

In mitral stenosis the enlarged pulmonary artery is seen in the anterior position as a prominence of the middle arc on the left heart border. It may also be seen in the first oblique position accentuating the middle curve of the œsophagus. The small aorta of this lesion forms but a slight impression on the œsophagus. In comparison, the middle curve is large, or more often it blends with the higher and slighter aortic impression to make a long and convex combined curve (Fig. X.). Yet many patients with mitral stenosis do not show the middle curve well, possibly because the large left auricle rises too high in the mediastinum to give it room.

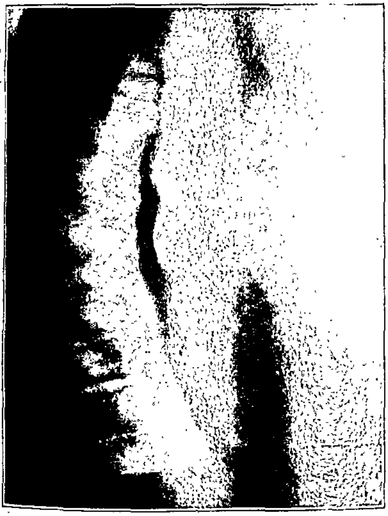
In published accounts of the radiology of mitral stenosis the pulmonary artery impression has sometimes been reproduced on the accompanying figures without comment in the legend or text—e.g., Steel,[8] his Fig. 7; and Rigler,[7] his Fig. 8 (see also his Fig. 6).

Emphysema and other chronic pulmonary diseases sometimes lead to enlargement of the pulmonary artery demonstrable on X ray examination. In Fig. XII. this makes its mark on the œsophagus as a middle curve. In a proportion of cases of goitre, where this is affecting the heart, the pulmonary artery becomes not only more pulsatile, but more prominent, and we have examples of its imprint on the œsophagus. Aneurysm of the pulmonary artery is rare, and mostly seen with congenital defects (Fig. XI.).

Apart from cardiac conditions, it is interesting to note that in many of the published radiograms showing great dilatation of the œsophagus from cardiospasm, the lax and distended œsophagus happens to facilitate and thereby to emphasise the curve we describe (e.g., Walton,[9] his Figs. 447 and 453). As the region of the left bronchus is a favourite site for carcinoma of the œsophagus, this will be remembered and excluded before this particular displacement is referred to a cardiac condition (e.g., Assmann,[1] his Fig. 397, p. 485). Cancerous glands in the bifurcation of the trachea may also simulate the pulmonary artery curve, and such a case is figured by Grashey,[3] his Fig. 8A, p. 49.

(*References at foot of next page.*)

FIG. VI.

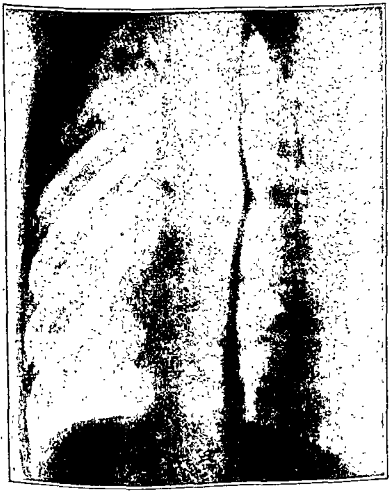


DRS. [illegible]IN PARKINSON
AND
D. E[illegible]N BEDFORD:

THE [illegible]ULMONARY ARTE[illegible] IMPRESSION ON T[illegible] ŒSOPHAGUS.

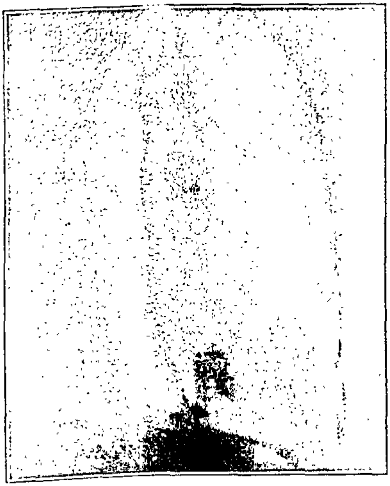
Teleradiogram (first [illegible] position) of normal heart. Man aged 50. The [illegible] œsophagus shows from above downwards: (1) [illegible]rtic curve; (2) the pulmonary artery curve [illegible] an[illegible] slight left auricular curve.

FIG. VII.



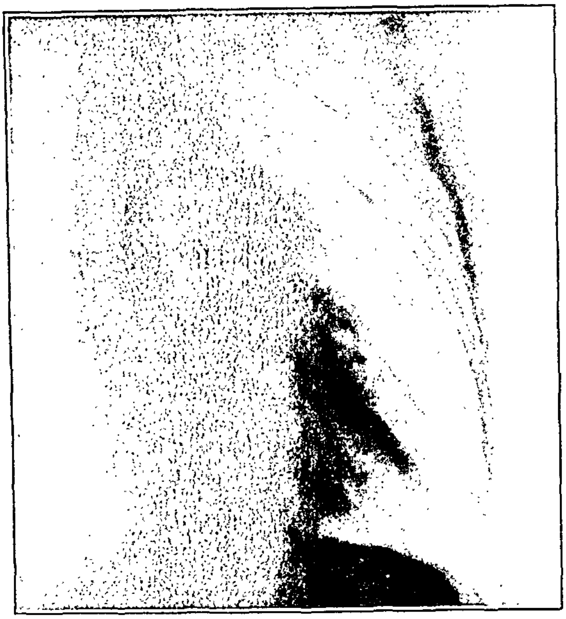
Teleradiogram (second oblique position) of normal heart. Man aged 60. Below the aortic arch is seen the bifurcation of the trachea, and alongside it the pulmonary artery and its left branch. The œsophagus shows a slight aortic curve with convexity forwards, and below it a pulmonary artery curve with convexity backwards—i.e., to the right.

FIG. VIII.



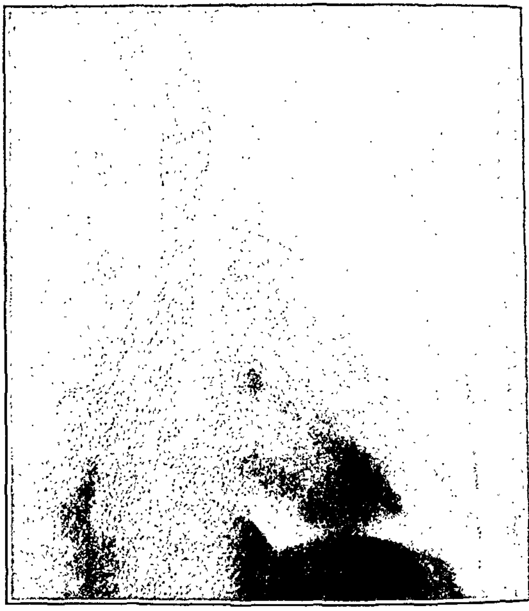
Teleradiogram (first oblique position) of atheroma of aorta. Man aged 69. Below the high aortic curve of the œsophagus is a long, shallow middle curve, adjoining which is the dividing pulmonary artery (denser shadow), separated from the œsophagus by the left bronchus.

Fig. IX.



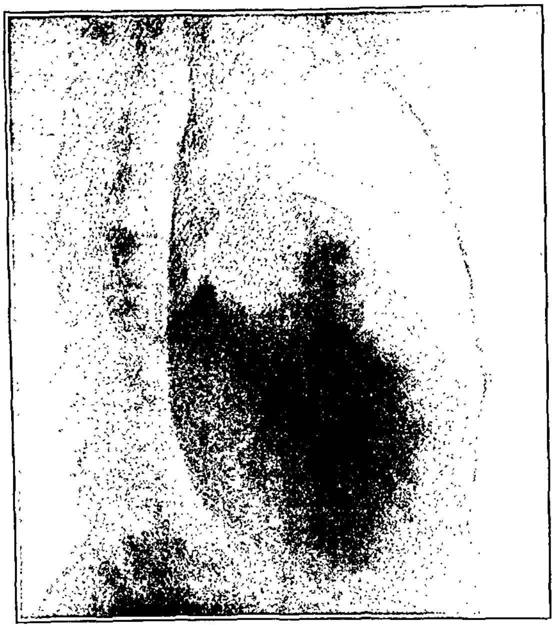
Teleradiogram (first oblique position) of congenital heart disease with enlarged pulmonary artery. Man aged 31. The thin streak of barium in the œsophagus shows a small aortic curve, a large middle curve (behind the large pulmonary artery), and a shallow auricular curve.

Fig. X.



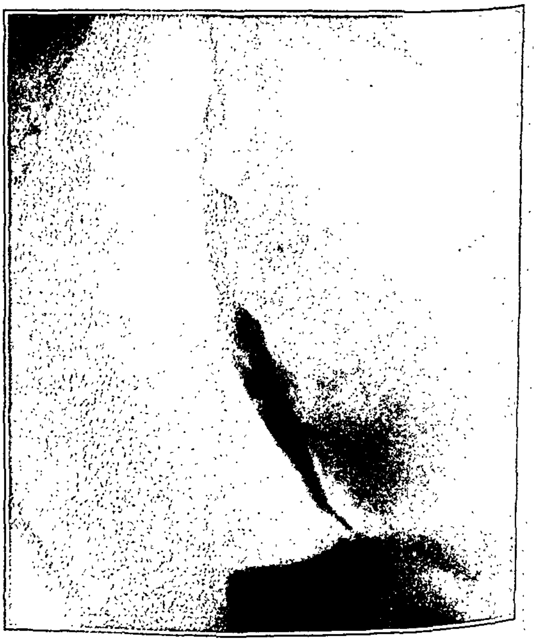
Teleradiogram (first oblique position) of mitral stenosis with fibrillation. Man aged 44. The œsophagus shows two curves only—a combined aortic and pulmonary curve above and a prominent auricular curve below. The left bronchus separates the dense pulmonary artery from the lower half of the combined upper curve.

Fig. XI.



Teleradiogram (first oblique position) of congenital heart disease with aneurysm of the pulmonary artery. Woman aged 48. The œsophagus shows a small aortic impression, a distinct pulmonary artery impression, and the left auricular curve.

Fig. XII.



Teleradiogram (first oblique position) of emphysema and aortic atheroma. Woman aged 66.. The relation of the upper œsophageal curve to the aorta, and of the middle curve to the pulmonary artery, is shown.

ON THE PREVENTION OF MALARIA WITH PLASMOQUINE.

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AND

P. G. SHUTE,
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IN THE LANCET of June 6th (p. 1248) reference was made to our experiments having for their object to ascertain whether any known or reputed anti-malarial remedy is a true preventive of human malarial infection contracted in the natural way by the bites of mosquitoes. The principles and technique of our method of test were described, and our finding was reported that the synthetic preparation, Beprochin (now supplied as tablets labelled "Plasmoquine brand of beprochin"), successfully fulfilled the requirements of the test in all of eight experiments, while similar trials with six other preparations invariably failed to do so. Following this finding, we repeated the experiments with plasmoquine on a further series of patients at the Horton Mental Hospital, Epsom, and two of us tested its prophylactic efficacy on themselves, one (W. D. N.) to protect against benign tertian infection, the other (P. G. S.) against malignant tertian. The same success having attended these trials, we decided that it would be justifiable to call for volunteers to undertake a confirmatory experiment. In this matter we were greatly assisted by Sir Almroth Wright, who kindly permitted the experiment to be conducted under his auspices at the Institute of Pathology and Research, St. Mary's Hospital, and by Dr. Ian Maclean, Prof. A. Fleming, and other workers in the Inoculation Department of the hospital, who made themselves responsible for the attendance and supervision of volunteers and for other important details. Dr. Wilfred Harris kindly arranged that a patient who was to undergo a course of malario-therapy in St. Mary's Hospital should serve as a control case, and we arranged for other control cases at St. Thomas's Hospital, the West End Hospital for Nervous Diseases, and elsewhere. One of us (S. P. J.), who had not hitherto tested the prophylactic action of the drug on himself, took part in the confirmatory experiment, and the other volunteers were: Messrs. E. V. Bevan, L. J. Clapham, Stanley Cooper, A. G. Cross, W. B. Johnston, A. N. McCrea, R. C. MacKeith, and J. Williams and Miss E. Ward. All are students at St. Mary's Hospital Medical School.

The manner in which the experiment was conducted and its result may be described in diary form, as follows:—

Diary of the Experiment.

July 1st: Infection of a batch of 230 *Anopheles maculipennis* for the purposes of the experiment was begun to-day by feeding on a case of benign tertian malarial fever and subsequent incubation at 25° C. The batch is No. 93. The patient's blood contains 880 gametocytes per c.mm. The count of ex-flagellating male gametocytes in moist preparations is 220 per c.mm.

July 11th: Feeding on the infecting case was repeated every alternate day until the 7th. The count of gametocytes and of ex-flagellating male parasites in the patient's blood has remained about the same as on the first day of feeding. Daily dissection of fed mosquitoes has proved that the batch is heavily infected, as many as 80 or more zygotes being found on the stomachs of some insects. To-day most of the zygotes are ripe and on the point of rupture; a few have already ruptured and discharged their sporozoites into the body fluids of the mosquito. The salivary glands of one specimen contain sporozoites.

July 12th: Sporozoites were found to be present in the salivary glands of all mosquitoes dissected to-day. Of the 230 insects with which the batch was commenced, 94 remain alive.

July 13th: The volunteers, ten in number, attended at 4 o'clock. The purpose and procedure of the experiment were explained, and each volunteer took the first prophylactic dose—namely, one tablet of plasmoquine simplex (0·02 g.). The procedure of infecting the patient in St. Mary's Hospital, who would be a control case, was demonstrated. The patient was bitten by several mosquitoes, one of which was then dissected to verify the presence of sporozoites in its salivary glands. The volunteers were informed that their prophylactic dosage would be one tablet (0·02 g.) three times a day (one after breakfast, one after lunch, and the third at bedtime) for six days, and that they would be infected to-morrow after they had taken the first two of the daily prophylactic doses. Each was given an explanatory card, ruled with headings and spaces, for noting the time at which each prophylactic dose was taken and any toxic or other symptoms observed.

July 14th: Volunteers attended in the afternoon for the procedure of being infected. Prof. W. Jameson and Prof. J. Gordon Thomson, of the London School of Hygiene and Tropical Medicine, Lieut.-Colonel J. A. Sinton, V.C., I.M.S., Director of the Malaria Survey of India, and other interested workers, kindly attended as independent observers. Cards were inspected to ascertain that the prophylactic doses had been taken, and then each volunteer was handed a separate glass jar containing five or six infected mosquitoes. Infection was effected by allowing the mosquitoes to bite the forearm through the mosquito-netting, with which the mouths of the jars were covered. The number of bites received was recorded, and from each jar a mosquito containing freshly drawn blood was selected for dissection, to prove infectivity by finding motile sporozoites in the salivary glands. The result of these dissections was positive in every instance. The numbers of infected mosquitoes by which each volunteer was bitten were: E. V. Bevan, 4; L. J. Clapham 4; Stanley Cooper, 5; A. G. Cross, 2; S. P. James, 4; W. B. Johnston, 2; A. N. McCrea, 4; R. C. MacKeith, 4; E. Ward, 3; J. Williams, 3. The third prophylactic dose on this day was taken by each volunteer ten

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DRS. PARKINSON AND BEDFORD: REFERENCES.

(*Continued from previous page.*)

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minutes after being bitten by the infected mosquitoes, instead of at bedtime. A patient at the West End Hospital for Nervous Diseases was selected as a second control case, and was infected by the bites of six mosquitoes.

July 15th: All taking part in the test attended again for verification of the numbers of bites received, and to ascertain that the prophylactic doses were having no ill effect.

July 17th: All attended again to receive an explanation of the manner in which the result of the experiment would be ascertained and recorded. It was pointed out that the average incubation period in benign tertian malaria caused by mosquito-bites is 14 days, but may be as short as 10 days or as long as 20. It was to be expected that the control case at St. Mary's would begin his malarial attack sometime during the week beginning Monday, July 27th (the 14th day after infection), and it was during that week and the next that the result of the prophylactic experiment would be ascertained and recorded. For this purpose each volunteer was particularly requested: (1) To record, on the second card provided, his temperature twice daily from Friday, July 24th, to Wednesday, August 5th, as well as any symptoms indicating a possible onset of malaria; (2) to attend on July 27th and 31st and August 5th for a specimen of blood to be taken and examined; (3) to keep in touch with us by telephone throughout the period of the experiment, and at its termination to return the cards filled in and signed, together with any personal observations which it might be desirable to note.

July 27th: Volunteers attended, as requested. Benign tertian malaria parasites were found in thin blood films of the control case at St. Mary's, but in neither thick nor thin films of the blood of any of the volunteers. Up to the present (by inadvertence on our part) the temperature of the patient at St. Mary's has been taken only twice daily (at 6 A.M. and 6 P.M.). For this reason it has happened that the actual day on which he commenced his malarial attack is not apparent from the chart, but from to-day his temperature will be recorded every four hours. The finding of parasites in a thin film indicates that, in all probability, he has had slight attacks of fever (lasting, perhaps, only a few hours) for one or two days; in any case, we can take the first date on which parasites were found as indicating the incubation period, which would thus be 14 days. In striking contrast is the fact that no volunteer has observed any symptom indicating the possible onset of a malarial attack, and that careful examination of both thick and thin films of their blood has yielded a negative result.

July 29th: The patient at St. Mary's had a temperature of 100° F. last evening and 102° F. this morning. The patient at the West End Hospital is also reported to have definite febrile paroxysms, indicating that the malarial attack has commenced.

July 31st: Volunteers attended, as requested. Blood films (thick and thin) were taken and carefully examined. In no case were parasites found, and no volunteer has felt any sign or symptom indicating a possible onset of malaria.

Aug. 5th: A third control case, infected at St. Thomas's Hospital by the bites of nine mosquitoes on July 17th, began his malarial attack on the 30th (incubation period 13 days), and a fourth (under Dr. W. J. Adie), infected by the bites of eight mosquitoes on July 20th, began his attack on Aug. 1st (incubation period 12 days). The control case at Horton, infected on July 20th, and given prophylactic doses of quinine before being bitten and daily for eight days thereafter, began to have febrile paroxysms from Aug. 1st (incubation period 12 days), but parasites have not yet been found in the peripheral blood. The mosquitoes used for infecting these and other control cases are those which bit the volunteers. Six volunteers attended to-day, and the remaining four (who were absent from London) will send their blood films and cards. No volunteer has felt any sign or symptom indicating a possible onset of malaria.

Aug. 7th: Blood films and completed cards of all volunteers have now been received and carefully examined. All blood films are negative, and no indication of malaria has been observed. In striking contrast is the fact that the control cases, infected by the same mosquitoes—namely, four persons who took no prophylactic and one who took quinine as a prophylactic—all developed malarial fever 14 days or less after infection.

Aug. 10th: To-day is the 27th day since the volunteers were infected. None has had any indication of malaria. On the 8th parasites were found in the blood of the patient at Horton, who, to serve as a control, was given quinine prophylactically for eight days, and she, as well as each of the other control cases, is now going through the usual malarial attack, with many parasites in the blood and quotidian or tertian rigors, during which the temperature rises to 105° F. or 106° F. The experiment may, therefore, be considered to have terminated.

Conclusion.

This experiment, and the 15 equally successful trials which preceded it, prove that plasmoquine effectively prevents mosquito-borne malarial infection among a group of healthy individuals who take the prophylactic doses. Quinine lacks this remarkable property. The successful result in the present test was obtained by taking 0·02 g. on the day before infection, and the same dose thrice daily on the day of infection and on the five following days, but, from the results of our previous tests, we know that somewhat smaller doses taken over a shorter period are equally effective. The next step should be to ascertain whether the preparation is effective when taken only once daily, and, if so, what may be the smallest daily dose which will prevent malarial infection in persons who are bitten by infected mosquitoes twice or thrice weekly over a prolonged period.

SWEEPSTAKES FOR HOSPITALS.—The Rev. E. J. T. Bagnall, secretary of the London Free Church Federation, recently sent a circular letter to 51 hospitals in Greater London, asking for their views on the desirability of raising money by means of sweepstakes. The Nose, Throat, and Ear Hospital, Golden-square, was the only institution which sent a favourable reply.

SUICIDES DUE TO GAS POISONING.—Returning a verdict of suicide while of unsound mind at an inquest at Hove on August 7th, on a single woman, aged 56, who was found gassed, Dr. E. F. Hoare, the coroner, commented on the fact that at the recent meetings of the British Medical Association at Eastbourne the question was raised as to whether it was possible to make the inhaling of gas obnoxious. Suicide by gas poisoning, he went on to say, was undoubtedly so easy and convenient that anyone who was a little unbalanced yielded to the temptation. If gas could be made more unpleasant to inhale its employment for self-destruction would probably be limited. In many cases, he added, if there were no gas at hand the suicide would have chosen no other form of death. On behalf of the gas company it was stated that the question would receive the consideration of the gas industry.

TOURNIQUET PARALYSIS.

A PLEA FOR THE EXTENDED USE OF THE PNEUMATIC TOURNIQUET.

By Nils L. Eckhoff, M.S. Lond., F.R.C.S. Eng.,
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Tourniquet paralysis is a sufficiently common complication of operations upon the arm and hand to warrant the careful consideration of every surgeon who is in the habit of operating on the limbs, yet I have been unable to find any reference to the condition in the English literature, and only one or two short articles in the French.[1][2]

The advantages of a bloodless field are so many that it is unnecessary to stress them here. The time lost in checking hæmorrhage is in itself a sufficient handicap to condemn any operation upon a limb that is not performed below a tourniquet. Yet there are surgeons who purposely refrain from using this aid, owing to the fear of inducing a tourniquet paralysis. What can be more disheartening to a surgeon than to perform an operation cleanly and simply with the help of a tourniquet, only to find convalescence marred by a paresis lasting throughout that critical period when voluntary active movements are so essential in the restoration of function?

Causation.

There are several possible factors in the causation of this calamity. It is difficult, at the outset, to assess the importance of the mere anæmia induced by the tourniquet upon the nerves themselves. From our knowledge of the sensitiveness of certain nervous structures to anæmia, paralysis of the nerves might be expected to follow at once upon the interruption of their blood-supply. Concussion of the brain—with immediate and complete cessation of function of the higher centres—is, according to most authorities, the result of sudden cerebral anæmia. Yet it is remarkable how little all the tissues of the limb—the nerves included—are affected in the vast proportion of cases where a tourniquet is used. As far as can be determined, the function of these structures is usually unimpaired by interference with their blood-supply for relatively long periods.

I have no knowledge of "ischæmic" contracture following the use of a tourniquet. This condition is, according to recent observations,[3] more likely to be due to venous than to arterial obstruction. The paralysis of nerves that occurs in 60 per cent. of cases of "ischæmic" contracture[4] is a secondary phenomenon, caused by the strangulation of the nerves in the inevitable fibrosis, and must not be confused with tourniquet paralysis. In the "ischæmic" cases the nerve paralysis comes on gradually, and can be, to some extent, relieved, if so desired, by freeing the encircling fibrous tissue.

Numbness of the finger-tips occurs fairly frequently after the use of a tourniquet. Numbness of the leg or of the forearm can be induced if the limb be kept acutely flexed for a long time, and passes off rapidly when normal posture is restored. These instances suggest a vascular phenomenon, as would also the case, recently brought to my notice, where a complete paralysis of the arms followed an operation for gall-stones, the arms being placed above the head during the operation. It is, nevertheless, probable, from the fact that most patients suffer no inconvenience after the application of a tourniquet, that anæmia of the nerves cannot be the sole cause of paralysis. The slow rate of recovery in a manifest case—two or three months—also indicates a graver lesion.

The time factor is by some held to be important. Forty-five minutes has been thought to be a safe limit, but from the fact that it is impossible to regulate other factors—such as the amount of the pressure applied—it is obvious that there is a wide margin of error. I have seen paralysis follow relatively short operations.

The type of the tourniquet has undoubtedly some influence. Most are agreed that the older thick rubber tube should never be used. A flat band, of the nature of an Esmarch's or Martin's bandage, seems safer, but, again, is not immune from serious consequences. It is true that paralysis does not follow with such readiness if the tourniquet is placed high up in the arm, so as to encircle the mass of the deltoid, or around the mass of muscles immediately below the elbow. I have, however, seen it in the former case.

The most significant fact in the study of this condition is that the paralysis is practically unknown in the leg. I have heard of only one case, and I have never seen one. In the leg the nerves are always, except where the common peroneal (external popliteal) crosses the neck of the fibula, relatively well covered and protected by muscular tissues, and nowhere come into close contact with the bone. In the arm, however, the neuro-vascular bundle can easily be palpated against the humerus along the inner side of the upper arm, and the radial (musculo-spiral) nerve runs in immediate contact with the humerus as it courses from the medial to the lateral side. This is the nerve usually affected in lesions due to the tourniquet.

The fact that the nerves are sensitive to pressure is well known. The axillary (circumflex) nerve is often affected in dislocations of the shoulder, and the radial (musculo-spiral) in "Saturday night paralysis." The ulnar nerve may be injured if the arm is left hanging against the edge of the operating table during anæsthesia, and is frequently compressed, even in the absence of vascular changes, by the fibrous band associated with a cervical rib. In some people if the arm is kept acutely flexed at the elbow with the hand at the back of the head, as when lying in bed, a tingling is produced in the hand, accurately corresponding with the area of distribution of the ulnar nerve. If the legs are kept crossed for long, a similar tingling occurs in the distribution of the common peroneal, due to pressure on its trunk behind the neck of the fibula.

From these considerations it seems almost certain that the paralysis following the use of a tourniquet is due to the effect of the direct pressure of the encircling band upon the nerves, pressing them against the bone, and not to any extent to the effect of a simple anæmia. This is borne out by the peculiar sensitiveness of the radial nerve, fitting in so well with anatomical considerations and so difficult to explain by any vascular process.

An explanation must also be found for the fact that the sensory fibres in a mixed nerve trunk suffer less than the motor fibres. Sherren[5], in his description of "incomplete nerve injuries," denies this dissociation, but the present series of cases show it clearly. It has been stated by Stoffel[6] and others that there is an exact grouping of the nerve-fibres in a mixed nerve, and that the sensory fibres run in the middle. This might suffice to explain why the sensory fibres recover soonest, or even escape damage, in a tourniquet lesion. But Stopford[7] stresses the evidence of Heinmann, Compton, Borchardt, and Wjasmenski, and

ANÆSTHESIA IN THE SECOND STAGE OF LABOUR IN PRIMIPARÆ.

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AND
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THE importance of anæsthesia in the second stage of labour is becoming more generally recognised and this investigation, as far as it has gone, suggests that there is at least one anæsthetic which can be used with absolute safety and efficiency. All the cases of this series were primiparæ. Gas and oxygen were given as a routine to all primiparæ with any degree of toxæmia, so that all the least favourable cases were included in the gas and oxygen group. For the remaining cases the anæsthetic was chosen at random. The figures for ether anæsthesia were taken from only 18 cases, and are given for what they are worth, ether having proved an unsatisfactory anæsthetic in the second stage of labour.

In each case a record was kept of the character, duration and frequency of the pains, the pulse-rate, and fœtal heart-rate, and the condition of mother and child after delivery; observations were taken every 15 minutes throughout the second stage. In the majority of cases some sedative—e.g., potassium bromide and chloral—had been given in the first stage, but the effect of such drugs had usually ceased to be evident before the anæsthetic was administered. It was impossible to estimate the effect of the anæsthetic on perineal lacerations, owing to the fact that deliveries were conducted by pupil midwives. Again, owing to the different factors operating, it was difficult to estimate the effect of anæsthesia upon hæmorrhage.

METHOD.

Anæsthesia was commenced at the beginning of the second stage of labour. A mixture of nitrous oxide, 4 parts, and oxygen, 1 part, was given first, the proportion of the two gases being varied to suit the needs of the individual patient. The patient was instructed to take two deep breaths of the mixture at the beginning of each pain, administration being continued throughout each contraction. Towards the end of the second stage, deep anæsthesia was required, and the anæsthetic was continued between the pains. The percentage of oxygen was also increased at this point, because if the patient were allowed to become cyanosed there was a chance of the infant being rather blue. In a few cases a little ether was added to the mixture during the birth of the head.

For these investigations a McKesson's portable apparatus was used, and was found very easy to control.

Comparison of Anæsthetics.

Other anæsthetics used in this series were: (1) chloroform (40 cases); (2) ether (18 cases); (3) chloroform 2 parts, ether 3 parts (20 cases). The effects of these anæsthetics, as compared with those of gas and oxygen, in the second stage are interesting, and are best shown by a series of tables.

Relief of pain was evident in all cases, and there was seldom any difficulty in persuading the patient to take the anæsthetic. Usually with gas and oxygen the patient was unaware that the baby was born, but in two cases it had no effect on the pain, and another anæsthetic had to be used. In a few cases the patient was difficult to control towards the end, but this difficulty diminished with increasing skill in administration.

TABLE I.—*Effect on Contractions.*

Anæsthetic.	Frequency of contractions.			Length of contractions.		
	Less frequent.	Same frequency.	More frequent.	Shorter.	Same length	Longer.
Chloroform ..	18	22	14	3	29	21
Ether	12	5	3	1	7	12
C_2E_3	7	6	6	6	5	8
Gas and oxygen ..	8	35	46	6	35	48

With gas and oxygen the length and frequency of the contractions were increased in 50 per cent. of cases (Table I.). Accessory muscles were used more freely when the appreciation of pain was dulled. With ether the length of the contraction was increased in 60 per cent., but the frequency was diminished in 60 per cent., and in all cases the time interval became very irregular.

TABLE II.—*Length of Second Stage.*

Anæsthetic.	1 hour.	1–2 hours.	Over 2 hours.
Chloroform	27	20	5
Ether	7	7	5
C_2E_3	10	8	—
Gas and oxygen	64	30	6
No anæsthetic	32	56	12

Of the gas and oxygen cases lasting over two hours, five were abnormal, two being extended breeches, one a contracted outlet, one a rigid perineum, and one a distended bladder. There was a definite decrease in the length of the second stage with gas and oxygen anæsthesia compared with the length with other anæsthetics (Table II.). Fifty cases of primiparæ in which no anæsthetic was used showed a further increase in the length of the second stage. Accessory muscles were not used so well with other anæsthetics as with gas and oxygen, because with diminished perception of pain there was also a certain degree of muscular relaxation. With ether it was difficult to get beyond the excitable stage and still maintain the contractions, so that the patients were difficult to control.

After-effects.—With gas the patient was quickly round. With chloroform and ether the patient was drowsy at the end of the second stage and took some little time to recover from the anæsthetic. Vomiting was not uncommon, because many of the patients came into hospital in labour, directly after a heavy meal. Vomiting with gas and oxygen anæsthesia was very rare. The effect on the pulse-rate, as an indication of exhaustion, is shown in Table III.

Gas and oxygen compares very favourably with other anæsthetics, in spite of the fact that this group contains 17 cases of toxæmia, in whom obstetric exhaustion is always inclined to be more severe. In 86 per cent. of cases the pulse-rate either dropped or rose only ten extra beats per minute.

The effect on uterine contraction, as shown by post-partum hæmorrhage, can only be suggested by the following figures, for it must be remembered that there are many other factors besides the anæsthetic which are responsible.

TABLE III.—*Pulse-rate.*

Anæsthetic.	Rate dropped.	Un-changed.	Up 10 beats.	Up 20 beats.	Over 20.
Chloroform ..	15	17	12	3	5
Ether	4	5	3	5	2
C,E, ...	7	4	4	3	—
Gas and oxygen	20	35	16	7	4

Hæmorrhage Exceeding 20 oz.

Chloroform.—3 cases.

Ether.—2 cases (one case due to retained placenta).

Gas and oxygen.—2 cases (one case due to retained placenta and one to severe toxæmia).

The *effect on the child* is suggested by Table IV., but it must be remembered that the skill of the midwife is a large factor in the condition of the child at birth. It is a common fault for the pupil midwife to hold the head too long on the perineum, and a certain percentage of cases of blue asphyxia are due to this cause.

TABLE IV.

Anæsthetic.	Cyanosed but crying at birth.	Blue asphyx.	White asphyx.	Drowsy and full of mucus.	Norm.
Chloroform ..	—	7	1	2	40
Ether	—	3	2	1	13
C,E, ...	—	1	—	—	17
Gas and oxygen	10	4	2	2	82

There was one stillborn infant in the gas and oxygen series, death being due to a tentorial tear.

Of the four cases of blue asphyxia with gas and oxygen anæsthesia, all were abnormal labours, and one case of white asphyxia was an extended breech. It must also be remembered that the infants of toxæmic parents are included in the gas and oxygen group.

Summary.

There are definite advantages in the use of gas and oxygen in the second stage of labour, which may be summed up as follows:—

1. Relief of pain.
2. Uterine contractions increased in length and frequency in 50 per cent. of cases.
3. Second stage of labour shortened.
4. No deleterious after-effects on the mother.
5. No serious effects on the child. (Slight cyanosis is not uncommon, but is seldom associated with apnœa).
6. Anæsthetic pleasant to take and easy to give, and depth readily controlled.

Two *disadvantages* must be noted, both of which may be summed up in the word "expense." Special apparatus is required, and the average cost per patient is about 2*s*., as opposed to 3*d*. for chloroform. The services of an anæsthetist are required throughout the second stage.

In conclusion we should like to thank Lady Barrett for originating this research, and for the interest she has shown throughout.

AN UNUSUAL CASE OF HODGKIN'S DISEASE.

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THE following case of Hodgkin's disease presents a number of unusual features, any one of which is remarkable in its own way; occurring all together they appear to form a unique combination.

A married woman of 55 was admitted to King's College Hospital under the care of the late Dr. F. W. Tunnicliffe on Jan. 13th, 1927, complaining of "fluid in the stomach," which she stated had come on nine weeks previously. There was ascites and œdema of the legs. The glands in both axillæ and both groins and at the occiput were enlarged. There was a hard nodular mass (possibly glands) in the right hypochondrium and there was dullness on percussion over the mediastinum in front. The liver dullness extended up to the fourth rib but the lower edge of the liver could not be felt because of the distension. On a subsequent occasion the liver was found to be enlarged an inch below the costal margin. The spleen was palpable. The abdomen was tapped several times, about 18 pints of chylous fluid being withdrawn on two occasions. The pathological report on one specimen of the ascitic fluid showed a fair number of cells, of which 90 per cent. were lymphocytes, and a fat content of 0·26 per cent. Blood counts showed a slight secondary anæmia, with some increase in the large mononuclears, which varied from 7·6 per cent. to 16 per cent.

About two months after admission the patient developed pleurisy with effusion on the left side, and turbid yellow serous fluid, containing about 25 per cent. total protein, was removed by aspiration. The patient's general condition subsequently improved, the pleural and peritoneal effusions did not reaccumulate, and she left hospital on April 23rd, 1927, the provisional diagnosis being lymphadenoma of the "deep" type—that is, affecting the deep lymphatic glands predominantly.

For the next 12 months she attended hospital as an out-patient, during which time her general health was poor and she had a troublesome cough with occasional vomiting, but the ascites did not recur.

She was readmitted to hospital, after an interval of a year, on April 27th, 1928, complaining of fluid in the chest, abdomen, and legs, also of cough, nausea, general weakness, and dyspnœa. She stated that her relapse had started three weeks previously. On examination there were physical signs of fluid in the right side of the chest extending up to the level of the second rib in front. No enlarged glands were felt in the neck or axillæ. There was ascites, the liver was slightly enlarged, and the left leg was œdematous.

On April 28th and May 15th the abdomen was tapped, 14 pints of chylous fluid, having approximately the same composition as before, being drawn off on each occasion. On May 4th the right side of the chest was aspirated and two pints of chylous fluid removed. The pleural fluid contained many leucocytes (mostly lymphocytes), a few red corpuscles, 12 per cent. protein, and 0·3 per cent. fat. Culture was sterile. On May 24th the patient had an attack of paroxysmal tachycardia lasting rather less than 12 hours, and another similar attack occurred six days later. On June 1st enlarged glands were felt in both axillæ and in the left groin, and the mediastinal dullness on percussion was increased. On June 5th a small lymph-gland was excised from the chest wall just below the right axilla and sent for microscopical examination. On June 7th the patient had suppression of urine, and passed no more urine up to the time of her death a fortnight later. The œdema increased, the thighs and lower part of the abdominal wall becoming very swollen. The blood-urea on June 11th was 119 mg. per 100 c.cm. and on June 20th it had increased to 197 mg. per 100 c.cm. In spite of this the patient's general condition remained remarkably good and, though somewhat drowsy at times, she was usually bright and cheerful, uræmic manifestations being on the whole completely absent.

She had eaten a good midday meal, chatted brightly to the other patients, and amused them by singing on the day before her death, which occurred quite without warning; she collapsed suddenly and died on June 22nd.

At *autopsy* milky fluid was found in both pleural cavities. The entire parietal pleura on the right side and the diaphragmatic pleura on the left were infiltrated, forming a thick pinkish-grey sheet of tissue with a nodular surface. The visceral pleura over the lower lobes of both lungs was similarly affected, in one place being more than an inch thick. The underlying lung was collapsed, but not invaded. There be justified by the desperate state of the patient. But I was warned by my colleagues to refrain from this heroic method, as they had witnessed fatal issues in all cases in which intravenous quinine was given. I am surprised that authors still recommend such a course. The supposed power of quinine to break up the obliterating and damaged erythrocytes in the cerebral capillaries is not actually beneficial. The liberated schizogonts can infest healthy erythrocytes and continue their deleterious effect on the brain.

My first four cases of malarial coma died, for I was a novice, and could do nothing to help them. At the fifth case I was struck by a new idea. Considering the encephalitic and meningitic varieties of malarial coma, I decided to try the administration of urotropine intravenously, in the hope of abolishing it. I remembered the power of this drug to pass the barrier of the cerebro-spinal fluid, so that it was recommended by pædiatrists and neurologists in the treatment of leptomeningitis. Recently Paul Rostock[1] wrote a monograph on the treatment of meningitis with urotropine, and on the various modes of its administration. I also took into consideration the capacity of this drug for elimination in the secretions of the liver and kidneys. The course of the drug is exactly that of the malarial parasite, and it should apply its bactericidal potency in just the necessary places.

I therefore injected into my fifth comatose patient 3 c.cm. of a 40 per cent. solution of urotropine, sterilised by a brief period of boiling. The effect was astonishing. All the serious cerebral symptoms began to evaporate slowly, and had completely passed off in three hours. The stuporose state in this and several more cases, and the convulsions in others, wholly disappeared. The pyrexia and the other signs of quiescent malaria, and the parasites in the blood, remained as in an ordinary case, thus showing that the urotropine does not damage the parasite directly. Its effect depends only on sweeping the capillaries of the brain and the secretory canaliculi of the liver and kidneys.

My own belief, which still needs direct experimental confirmation, is that the purification of the blood capillaries is brought about by the fixing power of the formaldehyde produced from the urotropine. This fixative potency raises the specific gravity of the damaged erythrocytes, hinders their adherence to the walls of the vessels, and facilitates their passage.

In this paper I have no intention of wearying the reader with reports of cases. I only wish to emphasise that all the symptoms of the comatose or convulsive state disappear after three to six hours, and that the patient becomes a normal malarial case with a mild course and favourable prognosis. I have observed this effect of intravenous urotropine in ten cases, all of which recovered from coma and eventually from malaria with the usual therapy.

SUMMARY.

In all cases of malarial coma, or any other acute involvement of the central nervous system in malaria, the intravenous injection of urotropine is the surest remedy to convert the severe state into a mild one. The urotropine exercises its salutary effect *loco dolenti*, in the cerebral capillaries and in the cerebro-spinal fluid, passing through the choroid and meningeal barrier.

My experience was gained four years ago, during an annual practice in the sub-tropical country of Tagykistan, at the city of Doshambe.

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[1] Deut. Zeit. f. Chir., 1929, ccxvii., 264.

PSYCHOSIS IN OSTEITIS DEFORMANS.

By W. J. Rutherfurd, *M.C.*, M.D. Glasg.

Dr. S. J. Hartfall's paper,[1] in which he upholds the rarity of mental symptoms in osteitis deformans, leads me to report the following case in which they were present :—

On Dec. 12th, 1925, a patient of mine, a man aged 62, sent for me. I found him in bed with the right thigh in plaster. He told me that he had fallen at his work 30 days previously, and had been taken to hospital with multiple fractures of the pelvis and of the thigh. He had come out with no evidence to confirm this diagnosis, and I had received no message about him from the hospital, on his discharge with his limb in plaster. I communicated with the hospital, and was informed that he had been admitted with fracture of the neck of the right femur (not of the pelvis at all), and that radiographic examination had revealed a condition of the bone suggestive of osteitis deformans.

A courteous letter (dated Jan. 11th, 1926) from the house surgeon went on to say :—

> "Further X rays of other bones were therefore taken (which I suppose led him to believe that he had multiple fractures), and these revealed changes in the skull, tibia, radius, spine, and pelvis, to a greater or less degree, and confirmed the diagnosis. Careful investigation of the history gave the stooping, pains in the back, and bowing of the legs, but not the increase in size of hats. . . .The ribs are, fortunately, not involved to any extent, and he gave no signs of chest trouble while here."

This man is still alive, and is now 71 years old. He is of low stature and shambling gait, with very definite bow legs. Of his two children, his son is in the ranks of the permanently out of work, and married after being a non-worker for many years ; his daughter has exophthalmic goitre, and married an out-of-work labourer of peculiar disposition, who, shortly after marriage, took to his bed for no obvious cause, remaining there until he was removed to the mental ward of the local workhouse hospital in January, 1927. There he was certified, and was removed to the county asylum, where he has remained ever since. With a descending heredity such as this it is impossible to be certain that, in the absence of osteitis deformans, this patient would himself have kept free from mental changes on attaining his present age.

Brief notes were, from time to time, taken over the past six years, and these may, perhaps, be allowed to speak for themselves without the addition of any running comment.

Jan. 20th, 1926.—No albumin or sugar in urine.

March 16th, 1926.—Sends urgently for a special visit, but, when seen, refuses to say what he wants or how he feels, except for the reiterated phrase, " very low." Examination entirely negative.

July 19th, 1929.—Says he trembles from head to foot since his wife's death in May of the present year. (He had her attended by another doctor, by the way.) Only slight tremor of hands. Knee-jerks normal. Thickened radial artery.

Aug. 5th, 1929.—Says his condition is urgent, and that he feels " right down ill," but either will not, or cannot, supply particulars.—Aug. 13th.—Again complains of being " very ill." Says that he feels all right sometimes, but that, as soon as he gets to his work in the mornings, a feeling of illness comes over him. Later in the day is seen striding along in the street at 10 P.M., going in a direction away from where he lives.—Aug. 21st.—Comes for treatment outside surgery hours, saying that he is " very ill."—Aug. 29th.—Is strange in his manner and incoherent in his speech.

Sept. 6th, 1929.—Says that he often feels irritable and miserable.—Sept. 9th.—Brings back his medicine, complaining that it causes him to have palpitation.—*Sept. 16th.*

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[1] THE LANCET, July 11th, p. 68.

—Says he is "downright ill with one thing and another." When asked what he means, he says that I have had him under my care for a good while now, and ought to know what is the matter with him without his telling me. I then ask him how he is feeling to-night, and his only reply is, "very poorly." A complete deadlock!—Sept. 23rd.—Will not take his medicine.

Oct. 21st, 1929.—Still complains about the way I am treating him. On its being suggested that he might care to attend the out-patient department of a local hospital, he says that he might get "better attention" there than I am giving him. He then suggests that I could, if I cared, do something more for him if he were a private patient than I am doing for him as a patient under the National Health Insurance.—Oct. 25th.—Has an inferiority complex with a delusion of persecution—the persecutor being myself.

Nov. 1st, 1929.—Appears with his National Health Insurance medical card in the surgery to-night, and asks for legal advice, saying that he "thought that I was a solicitor." —Nov. 4th.—Still haunts the surgery, and is obsessed with the idea that he is receiving inferior treatment because he is not a private patient.—Nov. 25th.—Says his medicine is "noxious," and refuses to take it. His objection is to its taste.

Dec. 2nd, 1929.—Has thrown his medicine away, although, to pacify him, he had been supplied gratuitously with a private supply.

June 20th, 1930.—Has a perionychia, and refuses to allow a septic bulla by the side of his finger-nail to be clipped away. —June 27th.—Has been tampering with his dressings.

Feb. 3rd, 1931.—Is still attending for treatment, complaining of all sorts of minor discomforts.

Aug. 9th, 1931.—Seen to-day, bringing the story up to date.

It is obvious that this man is in a perpetual state of vague discomfort; and at his age one almost feels tempted to promote euphoria by the use of one of the available habit-forming drugs. So long as he remains outside an institution it has seemed wiser not to adopt any such means of giving him comfort.

One records a history like this somewhat apologetically, in view of its obvious shortcomings. If, however, the subject is of importance at all it would seem justifiable to place such a story on record. It may also serve a useful purpose in reminding those who are apt to forget such matters of some of the real difficulties encountered in the every-day treatment of patients under the National Health Insurance Acts.

Manchester.

BRITISH MEDICAL ASSOCIATION.

ANNUAL MEETING IN EASTBOURNE.

SECTION OF ANÆSTHETICS.

AT the first meeting of this section on July 22nd the chair was taken by Dr. H. P. FAIRLIE, and subsequently by Dr. LANGTON HEWER. A paper on the

Progress of Anæsthesia

was read by Dr. R. J. CLAUSEN. The public, he said, believed that great advances had been made in anæthesia during the last decade or two. Their flattery was hardly justified if their anæsthetic was ether or chloroform on a mask; the resources at the command of the anæsthetist had considerably increased, but full advantage had not been taken of them. The standard in the large teaching hospitals was probably fairly high, but there was at times an unfortunate tendency for some new technique to be used exclusively in the hospital of its origin. It was essential that the surgeon should realise the importance of the anæsthetist's work, as they could make little advance without his interest and coöperation. Routine anæsthesia might be bad anæsthesia, but a good deal of routine was necessary for smooth work. Any one anæsthetist's standard technique might make little difference to healthy patients undergoing short operations, but a large proportion of cases were not so favourable and needed special adaptation. There was a striking lack of regard for the patient as an individual. In hospitals he was often almost lost sight of. His pillow was removed, and he was left in great discomfort, flat on a metal-topped table, with only a thin blanket underneath him, just at the time when he should be made easy and comfortable. Post-operative backache, headache, and even chest complications might be much reduced if every nurse were dressed and towelled for operation and laid on the table for an hour or two. A tendency sometimes appeared for the theatre to become a stage, on which the star performer displayed his skill, supported by leading lady, minor characters, and chorus, the anæsthetist being expected to supply the comic relief.

The mask and drop bottle were still employed far too often; their use should be limited to induction. Open ether had been described as a method invented by amateurs for amateurs. Local, regional, and spinal methods were not as fully used as they might be, nor were the advantages of gas, notably ethylene, exploited adequately. The gas apparatus available in England had tended to hinder the effective adoption of the method. People complained that the modern apparatus was too complicated; but they did not make that complaint of their motor-cars.

Wherever possible, in major or minor surgery, gas-oxygen should be preferred to ether alone, and, when circumstances did not forbid, ethylene should replace nitrous oxide. The fullest use should be made of combined methods. Ethylene was little more liable to explosion than oxygen-ether. For long oral operations intubation was necessary, but endotracheal insufflation was not to be recommended. The necessity for adequate premedication was not fully realised; morphia was essential in gas-oxygen, and no patient should come to operation without preliminary sedatives. Carbon dioxide and intravenous glucose should be more widely used. There was a striking lack of any serious attempt to investigate the problems of anæsthesia by means of observations on large numbers of cases. There was a considerable personal equation in inhalation anæsthesia—hence the wide diversity of agents, apparatus, and techniques, all with good results.

The reasons for the shortcomings of anæsthesia, said Dr. Clausen, were traditional and economic. Hospital and national customs died hard, and hospitals and anæsthetists alike could ill afford expensive modern apparatus. Nursing homes were often entirely devoid of equipment; consequently portable and simple—even crude—apparatus was used. Progress could only be achieved through the recognition by all concerned of the importance of anæsthesia as a subject. Its status must be maintained and improved. The standard of asepsis must be as rigid as possible. The position of the anæsthetist as a specialist must be made secure, and his services fully utilised in all cases. The demon of hustle must be exorcised, and the tyranny of long lists broken.

DISCUSSION.

Dr. K. B. PINSON spoke strongly in favour of ethylene, commenting on the absence of shock and after-effects. It was not potent enough to control some patients, and ether might have to be added. Attendants complained of the smell, but the patients never did. He used the nasal method, giving nitrous oxide, oxygen, and ethylene in sequence, and had and those in which the infection reacted from a sinus or infected teeth.

Mr. Herbert Tilley said that pain might be due to swelling of a band of tissue behind the tongue, which was red and raised, and in his opinion was not always due to sepsis.

Mr. C. A. Scott Ridout considered that this band was a frequent cause of pain, but thought it due to sepsis. Sometimes an anatomical peculiarity, such as a long styloid process, predisposed to pain.

Mr. H. V. Forster, Mr. J. A. Gibb, and Mr. Lowndes Yates also spoke; and Mr. Bedford Russell replied.

Mr. Musgrave Woodman opened a discussion on the

Treatment of Carcinoma of the Œsophagus.

He considered first the reason of the total failure of our present means of treatment to effect a cure, and pointed out that this in part depended on the free anastomosis of lymphatic channels in this region, and in part on the mobility of the œsophagus, which limit the formation of a zone of adhesions adequate to prevent the spread of sepsis from the lumen of the gullet to the thorax. In cases in which the cancer was limited to the cervical part of the œsophagus, he advocated its excision. In patients in whom the cancer lay within the thoracic segment of the œsophagus, he condemned all methods which demanded opening of the thorax as being too severe for these debilitated patients. For cancers of the thoracic segment, he advocated diathermy, on the grounds that it was a painless operation, which increased the lumen of the gullet and gave an increased ease of feeding, although it never cured. The interstitial application of radon, he thought, had failed, because the upper portion of the growth alone was treated. The central implantation of radium was the treatment that he advocated. He attributed part of the failure to secure more fortunate results to the irritation of the metal tubes in which the radium was carried. He had therefore caused to be made tubes of soft rubber. These he showed, and later, in discussion, members expressed approbation of their design.

The President voiced the feeling of the meeting in expressing their regret that Sir Charters Symonds, the pioneer of treatment of œsophageal cancer, could not take part in the discussion. Mr. Mollison agreed with Mr Woodman that diathermy would not cure, but it relieved dysphagia. He advocated gastrostomy, and had knowledge of an exceptional case in which dysphagia due to œsophageal carcinoma was relieved, and the patient swallowed comfortably till he died of a recurrence five years later.

Mr. Scott Ridout gave details of a case in which a great regression of a growth had taken place. He also advocated gastrostomy, which he does as a routine under local anæsthesia.

Sir James Dundas-Grant advocated early gastrostomy. He referred to perforations of the œsophagus after using radium, and thought that Mr. Woodman's tubes would go far to diminish their occurrence.

Mr. Davis stated that the radium results were worse in œsophageal cancer than in any other site of carcinoma.

Mr. Woodman, in reply, said that although treatment by radium held the field to-day, diathermy should not be given up, for, after its employment, the patient often swallowed better than after any other form of treatment. He believed in small amounts of radium at a considerable distance from the growth. Large doses gave bad results. He disagreed with the performance of gastrostomy as a routine. He had used it largely in the past, but now had almost dropped it, for he found that the mental effect upon the patient was so bad.

Mr. Horgan read a paper on

Development and Anatomical Peculiarities of the Upper Jaw

in Relation to the Surgery of the Nasal Sinuses. He referred briefly to the work of Keith and Campion on the development of the upper jaw, and emphasised their bearing on the conventional forms of operation for chronic nasal sinus disease. It was on the points brought out in this work that he based his belief that the most adequate line of approach to the antrum, ethmoidal, and sphenoidal sinuses was by the canine fossa route.

Mr. Bedford Russell suggested that the transantral route of attack on the ethmoids had a good deal to recommend it. It formed, in his opinion, one of the few examples of cases in which it was better to open the antrum from the mouth in preference to the nose.

Mr. O'Malley said that he had never tried the method which Mr. Horgan advocated, and was personally satisfied with the methods of approach by intranasal routes.

Mr. Tilley considered that antral inflammations could be divided into two—namely, the isolated antra, with a localised infection in which he advocated drainage by the intranasal route, and, secondly, the cases in which general polypoid degeneration of the nasal and antral mucous membrane had taken place. In these the buccal route was, he thought, preferable.

Mr. Forster recommended the intranasal route for opening the antrum, and found that local anæsthesia was adequate for the purpose.

Mr. Gibb spoke of the importance of preliminary intranasal medication before the operation, and Mr. Horgan replied.

Sir James Dundas-Grant read a paper on

The Nasal Element in Spasmodic Asthma,

in which he advocated treatment of the nose, which was frequently the peripheral source of the hyperexcitability of the vago-accessory nucleus. He pointed out that other conditions, such as a susceptibility to foreign proteins, a peripheral stimulus from some other region than the nose, or psychic disturbances, also caused hyperexcitability of this centre, and stressed the need of careful differential diagnosis of the cause of asthma. He considered that the nasal element was an important one in asthma, in support of which he cited the commonness of nasal abnormalities in cases of asthma, the improvement following the removal of these abnormalities, the return of the asthma when the nasal abnormality recurred, and the lessening of the hypersensitiveness to the foreign protein after nasal treatment. He found that when the asthma was of nasal origin the lesion generally lay in relation to the upper and back part of the septum. Operative treatment in children gave, in his opinion, specially good results.

Mr. Bedford Russell cited examples of difficulties that might arise in diagnosis.—Mr. C. A. B. Horsford advocated that operation should be of a thorough nature, or it would fail.—Mr. Horgan spoke of maxillary and ethmoidal sinusitis as a cause of asthma.

REVIEWS AND NOTICES OF BOOKS

Medical Jurisprudence.

Third edition. By ELMER D. BROTHERS, B.S., LL.B., Member of the Chicago Bar. London: Henry Kimpton. 15*s*.

Legal Medicine and Toxicology.

By RALPH W. WEBSTER, M.D., Ph.D., Clinical Professor in Medicine. Rush Medical College. University of Chicago. London: W. B. Saunders Co., Ltd. 37*s*. 6*d*.

Medical Jurisprudence and Toxicology.

Fifth edition. By JOHN GLAISTER, M.D., D.P.H., F.R.S.E., Professor of Forensic Medicine, University of Glasgow; and JOHN GLAISTER, Jun., M.B., Ch.B., M.D., D.Sc., J.P., Professor of Forensic Medicine, University of Egypt. Edinburgh: E. and S. Livingstone. 30*s*.

Recent Advances in Forensic Medicine.

By SYDNEY SMITH, M.D., M.R.C.P., D.P.H., Regius Professor of Forensic Medicine, University of Edinburgh; and JOHN GLAISTER, Jun. London: J. and A. Churchill. 12*s*. 6*d*.

Two of this important series of medico-legal text-books take origin from the University of Chicago. Mr. Brothers' volume is written by a lawyer for doctors, and aims at being little more than an exposition of the law of the United States as it affects the medical practitioner. The medical sections are, indeed, so antiquated that one might easily overlook the merits of a work which contains a large amount of valuable information in a small space. The student of forensic medicine will note with interest how closely the American courts have kept to the English in developing the legal principles from which both systems derived. In some respects American courts appear to be harsher to the doctor—e.g., in awarding damages for negligence or for unauthorised operative interference. On the other hand, our American colleagues escape more lightly in actions for breach of professional confidence. An important difference has arisen in respect of the law of insanity. The doctrine of the "uncontrollable impulse," still regarded here as a heresy, has been accepted in most States of the Union. Laws against abortion also show deviations, for in some States it is not held to be a crime unless the woman has quickened, and in all statutes dealing with the subject explicit exemption is granted in cases "where premature delivery is necessary to save the mother's life." This statutory protection for therapeutic abortion (unknown to English law) has had a curious effect. The majority of courts hold that the onus is now on the prosecution to prove the *absence* of a medical necessity for the operation, with the result that the law is, in practice, almost a dead letter. It is consoling to observe that America is struggling, like ourselves, with anachronistic laws on Sunday observance—but, again, with a difference. We forbid recreation on the Sabbath Day, and they forbid work. The doctor, one learns with mingled feelings, is considered exempt from these restrictions.

More ambitious in scope is Prof. Webster's new text-book. The writer's personal interests appear to be mainly concerned with chemistry and toxicology, and these subjects have been allowed to occupy more than half a text-book which professes to cover the "usual phases of legal medicine." They are fully and competently treated, and the section on alcohol is particularly useful. It contains much important information about the effects of prohibition, and good descriptions of alcoholic poisoning. Certain important branches of medical jurisprudence are inadequately handled; with the result that the value of the book to students is much impaired. The section on "wounds and injuries" devotes only a few lines to "regional wounds" and little more to hæmorrhage. On the all-important subject of medico-legal autopsies and reports, the author blandly observes, "we have nothing to say, as we prefer to refer for such details to the articles of Helstoen, Le Court, and Lorries." In this volume of 830 pages there are only 49 illustrations, and of these only one (a badly smudged reproduction of finger prints) is original; the remainder are taken from well-known text-books. More surprising is the entire absence of original case material from a book which is remarkably well documented and rich in references to current literature. Unless Chicago has been cruelly maligned, a magnificent opportunity for practical research has been neglected.

Prof. Glaister's familiar text-book is conspicuously strong at the points where Prof. Webster's is weak. The section on post mortems and reports is in the best traditions of the Scottish schools, which have always grounded their students well in these important respects. The chapter on finger-prints is a treatise in itself, not to be equalled in any similar text-book. The greatest strength of the book, however, lies in the unique mass of case material which the older professor has accumulated in a long career in Scotland, and which his son has more recently enriched from Egyptian experience. Details of recorded cases are particularly valuable to the medico-legal expert, who has to work out relationships of cause and effect in obscure circumstances, with, perhaps, a man's life hanging on his estimate of probabilities. Here we have in detail the stories of classic crimes, with their morals made clear for future generations of experts. In the section on toxicology, the tests are well described and the information is up to date. It is difficult to run such diverse legal systems as those of England and Scotland in double harness in the confines of one volume; and it cannot be said that the authors have always been entirely successful. The section on incest, for example (p. 518), leaves the English law on the subject in considerable doubt. The legal age for marriage is incorrectly stated on p. 437. The most serious defect, however, is the absence of all mention of the Mental Deficiency Act, 1927, and the Mental Treatment Act, 1930, an omission which renders the chapters on these subjects misleading to English students. In a future edition some of the luxuriant growth of minor case records might well be pruned to make room for more up-to-date references to legal enactments and decided cases. With the medical aspects of their subject the authors have kept well abreast.

The small and modestly named volume presented by Profs. Sydney Smith and Glaister, Jun., is in reality a collection of valuable monographs on some of the most difficult problems confronting the medical jurist. Its very technical character will make it useful to Sherlock Holmes rather than to Dr. Watson, but its lucidity of style should enable even the cross-examining barrister to pick up invaluable hints. The amount of detailed learning on the examination of projectiles, of powders, and of weapons is astonishing. Full tables are given, showing particulars of every auspices ROEHL's method is being practised on a considerable scale at Cambridge and elsewhere.

The results of the present experiment, and of others now being conducted at Horton, should also have a noteworthy influence on future antimalarial policy in the world generally, for they indicate that, from now onwards, chemoprophylaxis and chemotherapy may play a larger part in the control of malaria than they have done hitherto. Everyone will remember that, after Ross's discovery of the mosquito cycle of the malaria parasite, KOCH, and later GRASSI, believed that the best hope of overcoming the disease on a large scale lay in an endeavour to break the epidemiological chain by treating the human host, rather than by measures aiming at destroying the insect carrier. That view has since received support from the success which has attended chemotherapeutic campaigns against kala-azar and bilharziasis, but, as regards malaria, field experiments on a similar plan have always failed because taking quinine, although it cures developed attacks, does not prevent either man or mosquitoes from becoming infected. If it is true that, in addition to quinine, a drug has now become available which, when taken in non-toxic doses by healthy people, prevents their infection, and when taken by malaria patients prevents the development of the parasite in the mosquitoes which feed upon them, it is reasonable to suppose that a repetition of KOCH's chemotherapeutic field trials might have a very different result. On a smaller scale, of course, the benefits of a drug which prevents malarial infection are clear. For example, malaria is the cause of much sickness and many deaths among the officers, crews, and passengers of ships trading to Africa, India, and the Far East. During the years 1918 to 1921 there were at least 20 deaths of seamen from acute malarial attacks during homeward voyages from those countries, and at least 65 from recurrences after arrival in England. In one line of steamers trading out of Liverpool no fewer than 531 cases of malaria occurred in the course of 12 months, and instances are on record in which, during homeward voyages from Africa or India, the disease attacked all except two or three of the whole ship's company. As these merchant ships seldom stay more than a few days and nights in malarious ports, it would be easy to arrange for all concerned to take the prophylactic doses during those relatively short periods and for a few days thereafter.

It is worth while, in this connexion appositely, to explain, in the light of the new knowledge, a "prophylactic trial" of plasmoquine which Dr. OTTO FISCHER was deputed by the Institute of Tropical Diseases, Hamburg, to conduct in April, 1926, on a steamship sailing to the African Coast.[1] The details were arranged by Prof. MÜHLENS, but, not regarding the drug as a true prophylactic, he based them on the view that "although plasmoquine alone is inadequate as a therapeutic remedy in subtertian malaria, some result might be expected from its prophylactic use as cases would be treated in the incipient stage when parasites would be relatively few and easily destroyed." With this object the drug was given in large doses (0·059 g.) on three consecutive days each week, instead of in small doses daily, as should have been done if true prophylaxis was the aim. The method left the 39 participating members of the crew unprotected on four days and nights of each of the nine weeks during which the trial lasted, and it is therefore not surprising that six cases of malaria occurred among them. It was claimed however, that this morbidity-rate (15 per cent.), indicated a successful result in comparison with the rates of 25 to 30 per cent. among the crews of two ships which followed the same route and on which the usual "quinine prophylaxis" was in force. Probably the correct explanation of the difference is that the plasmoquine taken by the crew on Dr. FISCHER's ship protected them against infection on three days and nights of each week, whilst the quinine taken by the crews of the other ships had no true prophylactic effect.

THE MANTLE OF FARR.

WE print in another column an appreciation of the work of Dr. T. H. C. STEVENSON from the pens of the Presidents of the Royal Colleges of Physicians and Surgeons, the President of the Royal Statistical Society, the President of the Section of Epidemiology and State Medicine of the Royal Society of Medicine, and of two other distinguished men of science. It would be something of a work of supererogation to seek to add anything to what has been said by writers so well qualified to give judgment, and, in any case, it would be premature to write of the career of a scientific man who, we may fairly hope, will *still* increase the debt of gratitude we owe to him by further researches, as if it were at an end. Nevertheless, we may be permitted briefly to recall to the memories of our readers something of the history of the office which Dr. Stevenson has done so much to dignify.

The General Register Office is, in comparison with most of our public offices, a young department; it is not yet a centenarian. A century ago such vital statistics as this country possessed were, if anything, below the standard of those of other civilised communities. Within 40 years English official vital statistics were admittedly the best in the world, and this pre-eminence has never been lost. Everybody knows, or *ought* to know, that this great triumph was primarily due to the harmonious coöperation of a first-rate administrator, GEORGE GRAHAM, and a statistical genius, WILLIAM FARR. Scientific and literary powers were vouchsafed Farr in abundant measure, but these gifts would not have sufficed to establish an efficient public department, and some little meed of praise is owing from posterity to the forgotten administrator who made the department a going concern. Farr was succeeded in office by a man of a different type. WILLIAM

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[1] Fischer, O.: "Über Malariaprophylaxe mit Plasmochin," Beihefte zum Arch. für Schiffs- und Tropen-Hygiene, 1927, xxxi., 43.

Ogle was, like Farr, a man of the highest character and public spirit, but, while Farr was a self-taught, energetic man of genius, knowing something of many subjects and without complete mastery of any one technique, Ogle was a highly educated, exact scholar, with the inhibitions and reserves that regular education imposes, and the publications of the department in his time lost something of the vivacity which Farr supplied. Ogle's successor, the late Dr. John Tatham, having the advantage of direct experience of public health administration under modern conditions which his predecessors lacked, effected noteworthy improvements, but even he hardly relieved the annual reports from a certain air of dryness which, in the opinion of some, is the appropriate quality of blue books. Under Dr. Stevenson's auspices this was changed. We do not mean that Dr. Stevenson reverted to the flamboyant method of Farr, and, like Farr and Silas Wegg, dropped into poetry, or, like Farr, made lists of odd surnames and speculated on their derivation. We mean that, like Farr, Dr. Stevenson looked upon the records as the raw material of research, and, using for the most part only the simplest of analytical methods, gave an impressive demonstration of the great and often forgotten truth that very simple methods, in the hands of a man of first-rate ability, will lead to discoveries which men of less ability, even if equipped with all the so-called mathematics in the world, are sure to miss.

We fear that few medical men read the annual reports of the Registrar-General. If more did, medical editors would receive fewer fallacious arguments for publication, and many journeys in search of mares' nests would never have been begun. Nobody has the excuse for neglecting these records of research that they are too mathematical to be intelligible. We can but hope that Dr. Stevenson may be able to use some of his leisure in bringing together into a separate volume his researches into the factors of infant mortality, a book which would at once become a standard treatise. Dr. Stevenson has, indeed, worn the mantle of Farr. When a man of great ability retires from office it is common form to say that his place will be hard to fill. In the present case the difficulty may well amount to an impossibility. Farr had so free a hand as an unofficial research worker, because, 80 years ago, official vital statistics had very little prestige, and important people or interests cared very little what was said by the Registrar-General or his subordinates. That is all changed, and although few really read the reports many use extracts from them as controversial weapons; hence there must inevitably be a tendency to prefer safety to brilliance, to discourage research, which, in the nature of things, cannot be safe. Dr. Stevenson has never been deliberately provocative, as Farr often was, but he has had a literary tact, if we may use the expression, which enabled him to say without provocation many true things not flattering to local or even national self-esteem. The task of his successor will not be an easy one. It will be hard to wear the mantle of Stevenson.

HYPERTENSION AS A SYMPTOM.

For some time it has been recognised that the symptoms associated with the earlier stages of hypertension—that is, before the onset of cardiovascular changes—are somewhat vague. That these diffuse symptoms of ill-health are due to the rise of blood pressure is rendered doubtful, because there is no correlation between the severity of the symptoms and the increase of tension, because the symptoms may often be relieved without reduction of the blood pressure, and also because definite hypertension may be found in people who regard their health as perfect. A year ago J. E. F. Riseman and S. Weiss[1] noted that the symptoms found in these early stages are very like those encountered in cases of psycho-neurosis with normal blood pressure. D. Ayman and J. H. Pratt[2] have now investigated a series of 100 patients, all of whom had a systolic blood pressure of 160 or more and no evidence of renal impairment; 17 of them were men, and 83 women. The commonest symptoms complained of were headache, pain, "nervousness," dizziness, fatigue, insomnia, and vasomotor disorders. The less frequent symptoms were widespread, and referred to all parts of the body. Further, these troubles were invariably multiple and of long standing, the average duration being over 10 years. Only four of these patients had no complaints. Ayman and Pratt next examined 50 psycho-neurotic patients of the same age as the others, but with normal blood pressures, and found that in this group the symptoms were almost identical, not only in character, but also in incidence, multiplicity, and duration. Passing on to inquire further into the onset of symptoms in the patients with high blood pressure, they ascertained that this often coincided with emotional disturbances or environmental difficulties. Ayman and Pratt were thus unable to differentiate between the symptoms associated with the early stages of high blood pressure and those of psycho-neuroses, and as evidence of a similar causation they remarked that so-called hyperpietic symptoms respond to removal of environmental difficulties, to sedatives, and to suggestion. A similar series of cases from which he draws the same conclusions is reported by D. Davis.[3]

F. R. Nuzum and A. H. Elliott[4] have tried to assess the part played by past illnesses, infections, and focal sepsis in the ætiology of hypertension. In those patients whose increase in blood pressure was associated with evidence of renal impairment they often found a history of scarlet fever and acute nephritis; but among those classified as "essential hypertension" the incidence of infection and focal sepsis was no greater than among controls. This investigation also suggested that there is no familial factor in the causation of high blood pressure, and that it is not unusually prevalent in patients with arterio-sclerosis of the larger vessels. Excessive obesity, however, was twice as common in patients exhibiting hypertension as it was in the control group. M. BACKER[5] too, after discussing the various drugs which have been lauded in the treatment of patients with a raised blood pressure, and after reviewing the various ætiological theories put forward by different workers, is forced to conclude that high blood pressure is not so much a disease as a symptom, which is found in people of abnormal nervous constitution and as a result of increased neuromuscular tonus of the arterial tree. The nervous factor in hypertension is also indicated, he says, by the great lability of the blood pressure, by which minor emotional upsets produce marked alterations of tension. The vegetative nervous system of the hypertensive patient reacts excessively to slight stimuli; mentally, this constitutional tendency manifests itself in neurotic symptoms, while in the cardio-vascular system it produces hyperpiesis. Ayman[6] has found that the blood pressure is liable to wide variations, particularly in patients with "essential hypertension," and in his most recent paper[7] he shows that this variation affects both the systolic and diastolic pressures to the same degree. The finding that the blood pressure, when observed sufficiently frequently and over long periods, exhibits these changes largely discredits many of the therapeutic effects claimed for various drugs, since, without very careful and frequent estimations before treatment starts, successful therapeutic reduction of the blood pressure may be simulated by minor changes due to emotion and environment.

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[1] Amer. Jour. Med. Sci., 1930, clxxx., 47.
[2] Arch. Int. Med., May, 1931, p. 675.
[3] Amer. Jour. Med. Sci., June, 1931, p. 850.
[4] Ibid., May, 1931, p. 630.

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[5] Amer. Jour. Med. Sci., May, 1931, p. 618.

[6] Jour. Amer. Med. Assoc., June 20th, 1931, p. 2091.

[7] Arch. Int. Med., July, 1931, p. 89.

ANNOTATIONS

THE SHORTAGE OF HOSPITAL NURSES.

WE publish as a supplement to-day the Second Interim Report of THE LANCET Commission on Nursing. It contains the questionnaire addressed to hospitals (printed in these columns on Feb. 28th) and a statistical and explanatory summary by Mr. Bradford Hill of the replies received. While comment on the document will not be expected from us, we may conveniently allude to the contents.

It is found that one-fifth of our hospitals fail to secure suitable candidates as sisters; one-half fail to secure the staff nurses and probationers of the standard they require. Nearly one-fifth of the full establishment of probationers leave annually, and it would seem that the hospitals must lose one-third of their annual entry, or in other words, more than one-tenth of their establishment of probationers without their becoming qualified. The improvised arrangements which are being adopted to meet the situation include the employment of temporary nurses, and the alteration of the educational standard. The report presents a picture of the nurse's life in hospital, her hours of work, her pay, her training, and her prospects, the arrangements for her recreation and holidays, her sleeping accommodation, and various other amenities of her career. These conditions are not constant and invariable in all the different classes of hospital; life in a children's hospital, a fever hospital, or a mental hospital has its special features. Making allowances for these differences, wide divergencies in many matters are found to exist. This Second Interim Report does no more than marshal facts and (on its last two pages) mention some opinions. The Final Report, expected to appear later in the year, will endeavour to recommend the remedies. Meanwhile, all who are concerned or interested in hospital nursing have the opportunity to give serious study to the materials which our supplement contains.

ECONOMO ON ENCEPHALITIS LETHARGICA.

IN 1917 Constantin v. Economo published a monograph entitled "Encephalitis Lethargica" in which he embodied the results of his researches on that disease. Twelve years later he gave an account of his further experience and surveyed the whole position. It is this latter work which Dr. Newman has now adapted to the needs of English readers.[1] Economo devotes some space to an assertion of his claim to have first identified and described encephalitis lethargica, "a new, hitherto unknown epidemic infectious disease, *sui generis*." This priority and the author's brilliant work is so universally acknowledged by neurologists as to make the assertion superfluous. When the disease was described, more or less independently, in 1918, by Cruchet and Netter in France and in England by MacNalty, McIntosh, and Marinesco, Buzzard and Wilson, due credit was given to Economo's prior claims, as soon as his original account[2] came through the war zone. At the same time Economo agrees with Crookshank and other medical historians that encephalitis lethargica has occurred before, although only now recognised as a pathological entity. He identifies with it the nona epidemic of the years 1890–91 in Italy, the "Tübingen sleeping sickness" of 1712, and various outbreaks of epidemic somnolence described by Ozanam, Lepecq de la Clôture, and others. This history is encouraging, for it strengthens the hope arising from the diminished incidence observed in most countries that the disease is disappearing from our midst. It is a fell disease, not only because of its high mortality in the acute stage, but on account of its severe after-effects. To these, under the title of "chronic post-encephalitic diseases," Economo devotes special attention, giving a concise account of the therapy both medicinal and psychological which his experience has shown to be useful. Dealing with the epidemiology and the character of the infection Economo considers it probable that the virus settles first in the naso-pharyngeal cavity and thence spreads along the lymphatic channels into the nervous system. It is therefore a droplet infection. He states that transmission of the disease from person to person seems rare and presumes this to be of secondary importance, because the virus once settled within the skull has little chance of getting out (*virus en cage* as Netter puts it). Here he seems to us to have paid rather scant attention to the possibility of carrier infection. In this respect encephalitis lethargica seems to follow the epidemiological behaviour of two other epidemic diseases of the nervous system, cerebro-spinal fever and poliomyelitis, in which contact infection plays a major part, but frequently escapes clinical notice because transmission is by the healthy carrier. Economo agrees with the view that the encephalitis of influenza is quite distinct from encephalitis lethargica. His book contains an excellent account of the acute forms of the malady, their course and prognosis, and of the morbid anatomy of both acute and chronic forms. A pleasing feature is the generous tribute paid by the author to the work of British investigators and to the report (1918) of the Local Government Board. Economo concludes his book with the remark: "Encephalitis lethargica can scarcely again be forgotten." Even if the time should happily come when the disease can only be studied in books such as this, Economo's fundamental discoveries will continue to influence the study of neuropsychology.

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[1] "Encephalitis Lethargica: its Sequelæ and Treatment," by Constantin von Economo. Translated and adapted by K. O. Newman, M.D., Oxford University Press, London: Humphrey Milford. 1931. Pp. 200. 18s.

[2] Wien. klin. Wochensch., 1917, xxx., 581.

ACCESS TO MUNICIPAL HOSPITALS IN BIRMINGHAM.

THE Birmingham City Council has confirmed its decision to exclude general practitioners from the treatment of patients in its two municipal maternity homes. There was a time when the patients might be attended by their own doctors if they wished, but most of the deliveries were undertaken by midwives and, when help was needed, the local practitioners were summoned by the matrons. Difficulties however seem to have arisen in maintaining a uniform standard of efficiency and in obtaining the doctors just when they were wanted. About a year ago the Council came to the conclusion that the employment of whole-time officers would avoid embarrassments, ensure better care, and minimise the risk of infection, as well as providing staff for the antenatal wards, premature babies' wards, and child welfare clinics. It would also enable the pupil-midwives to receive uniform instruction and supervision and would ensure that the medical officer who had watched the antenatal period should have charge of the confinement. The work of private practitioners was to be safeguarded by imposing an income limit for patients admitted to the homes.

The Council was so convinced of the value of these advantages that, although the practitioners protested, it would not consider reverting to the old method. It was prepared however to consider an arrangement whereby a doctor might send his private patient into one of the homes and follow the case through. In collaboration with the local division of the British Medical Association, the Council tried to work out a scheme. The Association made it clear that Birmingham practitioners wished ultimately to follow their own patients into all the hospitals of the city, and set out a series of proposals for the management of the maternity homes. They suggested that each home should be run by a committee of six, three appointed by the municipal authority—one of them in executive control of the home—and three being general practitioners, the chairman being an obstetrician. Every practitioner living within two miles of the home should be asked whether he was willing to attend his own patients and emergencies in the home, subject to the rules and regulations of the committee, and those signifying assent should form a rota. This would ensure that every patient had an approved doctor and—subject to his being willing and available—the doctor of her choice. The Council however found itself unable to agree to this proposal on the grounds that it could not forgo direct responsibility for the management of its institutions; that the executive medical officer would be in an anomalous position, being only one of a committee of control; and that the variations in standard and the difficulty in securing prompt attendance would not be removed. There the matter rests. The practitioners uphold their claim to access, maintaining that the standard of work would be as high as could be obtained by other means. The Council disagrees and has intimated that it sees no advantage in continuing the discussion.

TUBERCULOSIS IN RUSSIAN INFANTS.

DR. E. Rautenstein, who is in charge of a welfare centre in Leningrad, has studied[1] seven babies who showed symptoms of tuberculosis before completing the third month of life. Out of a total of 213 infants under observation by her at the centre, twelve gave a positive tuberculin reaction and among these were the seven infants with clinical evidence in addition to the biological reaction. Dr. Rautenstein first discusses whether infection took place before or after birth. She concludes that intra-uterine infection is of more importance than is usually admitted, particularly if the view of Calmette and his collaborators as to the existence of a filtrable virus is accepted. At the same time it has to be remembered that so-called intra-partum infection cannot be altogether excluded and a strong case against postnatal infection can be made out if the liver is more severely affected than the lungs. In the cases described a decision was impossible because the isolation of the mother from the child directly after birth had not been carried out. In the first rank of clinical evidence comes the temperature chart; it was sometimes possible to trace a short initial fever, then a nearly afebrile period during which the tuberculin test became positive, and a terminal febrile phase. This sequence was not always seen because of the circumstances under which the infants were observed. At the earliest stage a frequent occurrence was a period of vomiting and loose stools due, in the author's opinion, not to local bacillary invasion of the alimentary tract, but to a general reaction of the body to its first dose of tubercle toxin. Physical examination of the lungs revealed, as a rule, evidence of infiltrated areas by alteration in the percussion note, the breath sounds being commonly diminished. Cough was absent until shortly before death except when there was pressure of enlarged mediastinal glands upon the trachea or main bronchi; then it had the characteristic "ringing" timbre. Hæmoglobin and red cells were diminished in all cases; a definite lymphocytosis was only present in cases which recovered. The sedimentation rate was higher in the fatal cases but the rate required checking by the lymphocyte count and the tuberculin test; with consistent positive test and high count, a rate above normal was not inconsistent with recovery. Liver and spleen were enlarged in all the seven cases. Dr. Rautenstein doubts whether tuberculosis is really becoming more frequent in the early months of life. Slow loss of weight, slight fever, and anæmia following a short bout of diarrhœa and vomiting lead to a diagnosis of "marasmus" which is rudely upset at the autopsy by the discovery of tuberculosis. Such errors, which are unfortunate in leading to the source of infection being overlooked, could, she thinks, be largely avoided by systematic radiological examination of the chest. Even at this early age the disease is not necessarily fatal; three cases in her series appeared to make a good recovery.

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[1] Jahrb. f. Kinderh., 1931, cxxxii., 75.

DIABETES MELLITUS IN THE UNITED STATES.

A RECENT analysis of the apparent increase in the death-rate from diabetes mellitus in the United States has brought to light some noteworthy facts.[1] The increase is not at all uniform, it seems, when analysed by age, sex, or race. Mortality among older women, especially among coloured women, shows a rise which more than outweighs the great and definite improvement among the young. In the years preceding the discovery of insulin the death-rate from diabetes was steadily increasing at all ages under 45; since 1922 there has been a sharp decline at those ages. Among males above this age the rate has remained fairly steady during the insulin period, but among females it has been stationary only between the ages of 45 and 55, and above this there has been a steady rise. Over 65, the mortality has increased among males by 25 per cent. and among females by 40 per cent., and if we take the last four-year period the increase has been 33 per cent. and 50 per cent. respectively. Among negroes there has been no improvement whatever. The death-rate for males under 45 has been stationary, while for females it has increased 60 per cent. Over 45, the male negro death-rate has gone up by 20 per cent. and the female by 75 per cent.

Unfortunately, it is not clear from the analysis whether diabetes was the primary or merely a contributory cause of death, and it may be that the increase in the older classes is due to improved diagnosis, and that the deaths were due to such causes as arterio-sclerosis, which, as Prof. D. M. Lyon and Dr. Murray Lyon[2] have pointed out, is as likely to be a cause of diabetes as a result of it. These authors showed that in deaths from coma the average age in 150 cases was 37 years, while in "non-coma" cases it was 62. It is difficult, however, to see why improved diagnosis should apply to women more than men, and to coloured women more than white, and the figures strongly suggest that on the whole the incidence of diabetes has risen and that insulin does not deal effectively with the "degenerative" type of diabetes in elderly people, where this disease is only a small part of the picture.

Another interesting contribution is a study of 300 diabetic ex-Service men undertaken by the Medical Service of the United States Veterans Bureau.[3] While no special tendency to diabetes, or modification of its effects as the result of warfare, seems to have been proved, the investigation confirms many of the points which have emerged from the study of the disease among the general population. For example, it was found that cases with a normal cholesterol content of the blood were more amenable to treatment than those in which it was high. The chief cause of the persistence of hyperglycæmia and glucosuria, in spite of insulin therapy, seemed to be the presence of complications or co-existing diseases —79 per cent. presented such complications, and the average number was 2·6 per patient. The mortality was 4·6 per cent., and in the 14 fatal cases five of the patients were over 45 years old. The principal cause of death in these five cases was stated to be diabetes mellitus in two, diabetic gangrene in two, and pulmonary tuberculosis in one; while the secondary causes were all arterio-sclerosis or its variants. Of the nine deaths under the age of 45, diabetic coma was the principal cause in four, pulmonary tuberculosis in four, and nephritis and myocarditis in one. An instructive feature of the series was that in only five out of 300 cases (1·7 per cent.) did the clinical symptoms in themselves denote the presence of diabetes, whilst 30 cases (10 per cent.) were entirely symptomless. This is exactly the figure given by Joslin, and shows once again the importance of routine examination of the urine.

METROPOLITAN WATER.

Sir Alexander Houston's[1] report on the chemical and bacteriological examination of the London waters deals with the 12 months ended Dec. 31st, 1930, and the Director of Water Examinations to the Metropolitan Water Board for the twenty-fifth time supplies a valuable scientific year book in a fascinating way, incorporating into statistical and laboratory statements and memoranda much apt and amusing anecdote.

The report commences by a description of the chlorination of the Thames and New River water, and as chlorination will, at any rate, until something preferable for bactericidal purposes be found, be an accepted process of purification, it is useful to read the arguments in its favour. The change of front on the part of the public, from hostility to tolerance, and from tolerance to appreciation, is marked, and Sir Alexander holds that this revolution of opinion has followed the publication of definite information on the subject no less than the technical improvements in method. The public has learned that chlorination is a cheap and harmless way of destroying the known germs of epidemic water-borne disease, while the great objection to the process, the taste, which was, when chlorination was first introduced, a very definite one, has been met successfully. The water-consumer has a right to demand a water which is not only safe, but which is inoffensive to the taste, and this position has been reached. But much careful experiment and assiduous trial has preceded this satisfactory result, the production of a tasteless as well as a safe water having considerably tested the resources of chemical research; and Sir Alexander may be legitimately proud of the ability to state that now in 999 out of 1000 supplies success has been achieved. But he is not unduly complacent, for he asks his readers not to regard chlorination, however carefully and efficiently practised, as the ultimate solution of all water problems. "We must still," he says, "seek virgin sources of water-supply, still retain and maintain, as far as this is reasonably practicable, the old-established armoury of defence." Chlorination, that is, should be regarded primarily as a means of amplifying security, to whatever extent it has already been secured.

Following the information on chlorination, we have a section on prefiltration waters, which is introduced by Sir Alexander with a paragraph in which he likens the 49 storage reservoirs, extending over 2700 acres and holding about 20,000 million gallons, to a great lake, and he finds that the feeling of safety engendered by the comparison of these reservoirs to a natural lake is not misplaced. In 1922 the examination of prefiltration waters, partly suspended in the period following the war, was reconsidered by the Board, when it was determined to examine completely and thoroughly, chemically and bacteriologically, and each week, all the various kinds of water which feed the filters, raw water, stored water, gravel water, and so on. There were certain difficulties incurred in the bacteriological examination, but the disadvantages were compensated for in other directions, and the bacterial and chemical figures, as summarised under bacteriological and chemical results, of raw river and prefiltration waters make remarkable reading.

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[1] Statist. Bull., Life Extension Inst., N.Y., May, 1931.

[2] THE LANCET, 1930, ii., 293.

[3] Matz, P. B.: Military Surg., May, 1931.

[1] London: P. S. King and Son, Ltd. Price, 21s. net.

We have next an interesting description of the search for pathogenic microbes in crude sewage, for which examples were collected at the Barking outfall hourly for 24 hours, and mixed proportionately to flow. The procedure in searching for the typhoid bacillus is set out at length, with close analysis and tabular statements. The relation between water-supply, the composition of sewage, and the meteorological conditions is recognised in a section comprising meteorological notes extracted for the most part from the *Meteorological Magazine*. A comment on the position in this country for the year 1930, contained in a communication made to the *Times* of Jan. 28th, 1931, by Mr. E. G. Bilham, is quoted as follows: "Decade for decade, year for year, and month for month, the ten years from 1921 to 1930, and the year 1930 itself, have, in the amount and persistence of the rainfall, surpassed most of the records of nearly all the corresponding periods since 1731. In the last 200 years only one previous decade—that of 1871–1880—has had a higher mean rainfall than that which has lately come to a close, with a correspondingly damp December." Sir Alexander must be one of the few people who can derive pleasure from such a statement; and his comment is to "hope that the amplitude of our sources of water-supply are not likely to be imperilled." The report closes with a description at some length of the Kempton Park Works, which, as the most up to date of all the Board's works, deserve this special notice.

GASTRITIS SIMULATING PYLORIC ULCER.

A STUDY of affections of the pylorus simulating ulceration has lately been published by Dr. Östen Holsti[1] of Helsingfors. It was prompted, he says, by two cases of severe dyspepsia treated in hospital in 1928 and 1929, in which operation was performed on account of suspected ulceration. No ulcer was found, either in the resected or in the remaining parts of the stomach and duodenum, but the microscope showed acute deep gastritis. Holsti has since carried out detailed microscopical and other examinations in similar cases, and the material he now presents consists of 14 patients, of whom only three were women. There was a history of chronic constipation in six cases, and the dyspeptic symptoms had often begun in early youth, and had lasted several years. In as many as 11 cases they were those of an uncomplicated, juxta-pyloric lesion. The Wassermann reaction in the blood was always negative. There was a history in many cases of temporary improvement following dietetic treatment based on the diagnosis of ulceration. When these patients came to operation, no ulcer of the pylorus could be found, but microscopical examination showed signs of endo-, myo-, and peri-gastritis. The two main seats of the inflammatory process were the mucosa propria and the plexus myogastricus. In half the cases, permanent relief from all the symptoms followed the resection. Of the remaining seven, two derived only temporary improvement from it, two did not even experience temporary improvement, and three could not subsequently be traced. Holsti concludes that his material represents a somewhat heterogeneous group, in the members of which there was an interplay of various factors of no uniform character. No case was so simple or early that only a single factor could be held responsible for all the morbid changes, and it would seem, he says, that a vicious circle is constituted by the inflammatory factor, disease of the arteries, venous stasis, and changes in the intra-mural plexuses—all or some of which are to be found in various degrees and combinations in each case.

PHYSICAL CONCOMITANTS OF MENTAL DISEASE.

THE research laboratories of the City and University of Birmingham have become associated particularly with the discovery of focal sepsis in cases of mental disease. The latest report, covering the twelve months ended March 14th, records a continuation of this work; in one murder-suicide case the sphenoidal sinus was found full of glairy muco-pus, and in a case of insanity following typical encephalitis lethargica the sphenoidal sinus showed marked chronic disease and contained pus. No less than 5367 specimens have been examined and reported upon by the laboratory, a work which has necessitated the manufacture and use of 42,500 tubes of media and 5470 plates of culture media, an average of 3500 tubes and 456 plates per month. Research into nasal sinus bacteriology accounts for the greater part of these. A new method of examining fæces for typhoid and dysentery organisms, by intraperitoneal injections of specially prepared material into mice, is being studied, and further work on agglutination tests has been carried out. As a result of a large series of experiments a method of demonstrating blood in brain vessels has been devised which is superior to the best injection methods and does not possess their insuperable difficulties. This method opens up a new field of research in cerebral localisation. By applying it to sections one quarter of a millimetre thick it is possible to examine a whole brain in a couple of months. Chemical experiments have been continued on the resistance of red blood corpuscles to hæmolytic agents under varying conditions, and the permeability of the corpuscular envelope to inorganic substances and dyes has been quantitatively investigated. The permeability of colloid albuminous substances without lipoidal envelope has been determined by the use of masses of raw egg-white. An attempt is being made to separate viruses from brain-mash obtained post mortem by cataphoresis, using hæmoglobin as an indicator. A series of experiments has been undertaken to show whether heat alone is responsible for the temporary increase in the permeability of the brain membranes which is known to occur during malarial treatment of general paralysis; results so far seem to indicate that it is.

THE WORLD'S REQUIREMENTS OF NARCOTIC DRUGS.

SINCE the production and distribution of opium, morphine, heroin, and cocaine assumed international importance under the Opium Convention signed at The Hague in 1912, various estimates have been propounded as to the amounts of these drugs required for legitimate medical purposes. The Health Section of the League of Nations a few years ago arrived at the conclusion that 10·4 tons of morphine, 0·87 tons of heroin, and 6·0 tons of cocaine might be held to represent the world's annual requirements. A laborious and elaborate analysis, recently completed by the secretariat of the League and based on the statistical returns from the various manufacturing and consuming countries has resulted in yielding uniformly lower figures than those vouchsafed by the Health Section. The secretariat's figures are 8½ tons of morphine "as such," about half a ton of heroin, and 5 tons, or rather less, of cocaine. The figure for morphine is given for "morphine as such" because there is also to be brought into account the morphine used for conversion into codeine, morphine esters, and ethers, which have not hitherto been classed as "dangerous drugs," as well as into dionin and apomorphine. If morphine so utilised is to be included the secretariat puts the annual requirement at 31½ tons for all purposes, although the actual manufacture of morphine in 1929 amounted to 59½ tons, and it is estimated that not less than 100 tons of morphine in all its forms passed into illicit traffic. As regards raw opium the League's secretariat gives 375 tons as the annual world requirement for legitimate purposes; there is, however, also the opium prepared for smoking, of which some 600 tons are annually exported, for which India is responsible to the extent of 66 per cent. Lastly there is the opium consumed in British India, which amounts to 200 or 250 tons a year.

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[1] Acta Med. Scand., 1931, lxxvi., p. 313.

THE HISTORY OF THE AMPUTATING KNIFE.

THE historical section of the Museum of the Royal College of Surgeons has received many additional possessions during the past twelve months, some of which are described in the annual report of the Museum. Of these, not the least interesting to surgeons and students are the specimens illustrating the history of the amputating knife, which show the many changes that the blade of this instrument has undergone during the past thousand years. The series, arranged chronologically, begins appropriately with a replica of a Roman scalpel or cutting knife that was found with other surgical instruments at Pompeii; for the first description of the amputation of a limb is that given by Celsus (A.D. 30). This is followed by the model of an amputating knife described by Albucasis, with a long straight blade terminating in a sharp point, called by him a "knife-rasor," which was employed in the tenth century. Next is a model made from a drawing in the manuscript work on "Chirurgery," written by John Wryghtson, an English surgeon, in 1350. The blade of this instrument is short and at the extremity is curved slightly inwards. A century later, as shown in the next specimen, the form of the blade was completely changed and is curved backward with the cutting edge on the outside instead of the inside of the curve. In 1578, Ambroise Paré, in his "Chirurgie," described two knives that he used when amputating, one of which he calls an incision knife and the other a "crooked knife for dismembering," the blade of which is crescent-shaped with the cutting edge on the inside. The amputating knife described by another famous French surgeon, Guillemeau, in 1594, has a broad blade curved only at the extremity and is similar in shape to Wryghtson's knife of the fourteenth century. The knife described by Fabricius Hildanus in 1646, of which a model is shown, differs widely from its predecessors. It has a heavy blade shaped like a scimitar with the cutting edge on the outside of the curve. But this innovation apparently did not last long, for in 1665 Scultetus describes the amputating knives used in his time as having a crescent-shaped blade and figures a "crooked knife, wherewith," he says, "the flesh is to be cut in so far as the bone which must be saw'd off."

Early in the eighteenth century Sharp introduced his amputating knife with a curved blade which was sometimes made with a double edge, and later Perret's still more crescent-shaped blade with a periosteal elevator came into use in France about 1772. From 1760 to 1775 the curved blade of varying shape was favoured and it was in general use until 1788, when Loder advocated a knife with an almost straight blade which he had found to be effective. From about this period, the straight-bladed and relatively small amputating knife began to replace the strongly curved instruments used by Sharp and other surgeons in the earlier part of the eighteenth century. Benjamin Bell figures a straight knife in his "System of Surgery" in 1788, and Savigny in 1798 illustrates a knife with a blade intermediate between Bell's and Perret's, which shows that the straight type was gaining in favour. Savigny points out that "care should be taken in the construction of this instrument that the back is not thicker than is absolutely necessary to give and support the required firmness of the edge, otherwise it becomes unwieldy in its management." Sir Astley Cooper, however, appears to have preferred the broad back, for his amputating knife, shown in the series, has a very thick back with the sides of the blade much smoothed along its borders, but the blade is straight. Lisfranc, who observed that he preferred straight knives for amputation, taught that "when a knife is required for the forearm or leg, the cutting edges should be extended to the insertion of the blade into the handle." He therefore had his knives made with long slender blades with double edges. In 1846 Robert Liston established the long straight blade in favour, and this type has remained almost unchanged. His knives, which he had made in various sizes, sometimes measured over a foot long in the blade alone and were finished with a dagger point, the backs being sharpened for the last two inches. The cutting edge was almost straight till it curved upward near the free end to meet the back. In his "Practical Surgery" he thus explains his reason for the long slender blade: "The form and size of the instrument ought always to be in proportion to the extent of the proposed incisions as regards both their length and depth. If an extensive incision is necessary, an instrument presenting sufficient length of edge must be employed so that the parts may be separated smoothly and quickly." Although his knives had wooden handles, Liston always insisted that the handle of a surgical knife should be perfectly smooth and polished, so it could be effectively cleansed, and this idea was adopted by Lister.

This series serves to illustrate the interesting fact that in re-establishing the advantage of the long straight blade, Liston was but reviving a type that had been used by the Arabian surgeons of the tenth century.

INDEX TO "THE LANCET,"

VOL. I., 1931.

THE Index and Title-page to Vol. I., 1931, which was completed with the issue of June 27th, is now ready. A copy will be sent gratis to subscribers on receipt of a post-card addressed to the Manager of THE LANCET, 7, Adam-street, Adelphi, W.C.2. Subscribers who have not already indicated their desire to receive Indexes regularly as published should do so now.

SPECIAL ARTICLES

A NATIONAL MATERNITY SERVICE.

ANALYSIS OF FOUR SCHEMES.

Prof. J. M. Munro Kerr, at the forty-second Congress of the Royal Sanitary Institution held at Glasgow from July 4th to 11th, set out a scheme for a national maternity service. This differs in many respects from those already outlined in the Interim Report of the Departmental Committee on Maternal Mortality and Morbidity, published in August, 1930, and from the British Medical Association's Memorandum on a National Maternity Service Scheme for England and Wales, published in June, 1929; but it has a number of points in common with that described by Prof. W. Blair Bell in our issue of June 13th last.

GENERAL OUTLINE OF THE SCHEMES.

The need for more systematic and better antenatal and postnatal care is admitted by all. Prof. Blair Bell declares that the people who know most are not always in charge, and urges a scheme to pool resources.

The essential elements of the schemes of the Departmental Committee and the B.M.A. are the provision of a trained midwife to be responsible for the conduct of pregnancy, labour, and the puerperium; to supervise the patient, to teach her hygiene, and to call in the doctor for any abnormality or difficulty. Every patient at the same time is to be in touch with the doctor of her choice, who will make at least one statutory antenatal and one postnatal examination, and attend as required. The antenatal clinics in both these schemes would become more and more consultative or educational, and would only exist as routine centres where the doctor preferred to make his antenatal examinations at a clinic rather than his own consulting-room.

Prof. Munro Kerr starts from the same premise as the others—that the normal midwifery of the country is passing, and will continue to pass, into the hands of midwives, and that general practitioners for the most part do not wish to retain it. Those of them who are specially interested, and can spare the time, will be included in his obstetric service.

While the schemes of the Departmental Committee and the B.M.A. start, as it were, from the periphery—concentrating on the individual patient—those of Prof. Blair Bell and Prof. Munro Kerr work outwards from the centre, concentrating rather on the institutions that are to form the nuclei of the service.

ACCESSORY SERVICES.

The reports of the Departmental Committee and of the B.M.A. discuss the subject under the headings: doctor, midwife, accessory services. The doctor and the midwife are to perform the services already described, and both reports urge the need for better education in medical schools and midwives' training schools. Both suggest that an anæsthetist should be available under the scheme when required, but neither proposes the provision of anæsthesia for normal cases—a probable demand of parturient women in the future. Both provide for consultant services when the doctor in charge needs them, and both allow for institutional care of abnormal cases and of normal cases at the patient's wish or when home conditions are bad. Prof. Munro Kerr would have every primipara delivered in an institution. Both the Department Committee and the B.M.A. hope that the general practitioner will be able to follow his cases through their institutional period, but the Departmental Committee suggests that some one person—perhaps one general practitioner in a district—shall be appointed in charge of the institution, to give unified control and maintain the standard of treatment.

The B.M.A. wishes sterilised outfits to be provided in every case; the Departmental Committee would only have them "where required." The B.M.A. provides for home helps, and the Committee regards them as desirable. The other two schemes do not deal very much with these points. Prof. Blair Bell would have anæsthetics available everywhere, and would provide home helps. He would, however, make a radical change in the midwife system, insisting that all nurses who undertake obstetric work should be fully trained and should live in hostels, whence they would work both the clinics and the midwifery service.

THREE TYPES OF HOSPITAL.

Prof. Munro Kerr and Prof. Blair Bell both propose a regional scheme based on three types of hospital; Prof. Blair Bell compares his types to the base hospital, the field hospital, and the casualty clearing-station, familiar to us in the war. With these correspond fairly closely Prof. Munro Kerr's primary, secondary, and subsidiary institutions.

The "Primary" or "Base" Hospital.—Prof. Blair Bell would have areas of approximately 50 miles round a teaching hospital. At this base hospital he would have both students and midwives taught, and general, consultant, and specialist services provided for the area. He stresses the importance of having this in a general hospital, partly for reasons of economy, partly to ensure a better sense of proportion, and partly because of the better nursing service and the readily available consultative service in all departments. He would build no new maternity hospitals, but would build on to existing general hospitals where more accommodation was necessary. He would have these centres coöperate with existing maternity hospitals.

Here Prof. Munro Kerr differs from him, for he would have his primary hospital at an existing obstetric hospital. The teaching in these units would be primarily for medical students and not for midwives, and stress should be laid on post-graduate courses. The work would be general, consultative, and investigatory, with a domiciliary service, but not postnatal or infant welfare. He agrees with Prof. Blair Bell that the unit should be in charge of a university professor, so that there could be coöperation with the university laboratory and staff. He would do gynæcology in these primary units, but lays less stress on it than Prof. Blair Bell does in his base hospital, and would do especially emergency work, the primary centre being connected with the surrounding area by an efficient motor ambulance service. These should also be the research centres, equipped with first-class laboratories.

The "Secondary" or "Field" Hospital.—The second class of hospital in Prof. Munro Kerr's scheme would be of three types:—

(a) Other hospitals in cities where a "primary" is situated; these should be autonomous with full status, but they should not take the most difficult or the emergency cases, but should be reserved for "clean" cases and do the ordinary

NATIONAL MATERNITY SERVICE: COMPARISON OF THE FOUR SCHEMES.

—	DEPARTMENTAL COMMITTEE.	B.M.A.	BLAIR BELL.	MUNRO KERR.
Principal idea of scheme.	Provision of midwife for every case, and doctor for ante- and postnatal care and abnormality.	Same as Deptl. Ctee.	Definite National service to pool resources and give control to obstetricians.	Network of obstetric centres on basis of existing organisations.
Duty of doctor.	Responsible from "booking" to end of puerperium; specified antenatal and postnatal examinations. Attendance as required by midwife.	One prescribed antenatal and one postnatal examination and see patient when referred by midwife.	General practitioners or pædiatrists would staff clinics remote from the hospitals and some of the clinics at large hospitals ("field").	General practitioners would staff cottage hospitals and the antenatal, postnatal, and infant welfare clinics run from them. Panel of G.P.'s specially interested.
Duty of midwife.	To supervise; teach hygiene; arrange antenatal care; attend labour and puerperium (14 days); advise postnatal examination; refer to doctor for any abnormality. Standard of midwife to be raised.	Same as Deptl. Ctee. To have more practical training.	Midwives to be abolished and all obstetric nurses fully certificated, living in hostels and working the clinic and domiciliary service from them.	—
Duty of clinics.	To become more and more consultative and to teach midwives.	To teach mothercraft. If doctor prefers to see his patient in a clinic, then a clinic should be arranged for him at the local maternity hospital.	Those at "base" to be consultative.	To become sorting-out centres, keep records, do simple laboratory tests, and arrange supplementary services and domiciliary work.
Domiciliary services.	Average case to be attended at home. Home helps desirable.	Normal cases treated at home. Home helps to be available.	To be run from "field" hospitals, worse cases being referred to base. Home helps.	To be run from all three types of hospital by G.P.'s specially interested and prepared to undertake whole care. Home helps.
Delivery in hospital.	Beds for abnormal cases; when the home conditions are bad or when the patient wishes. G.P. to follow case through.	Beds where required (as in Deptl. Ctee). Same doctor to attend if possible. Three per cent. need hospital treatment; 1500 beds required.	One quarter of cottage hospital beds (not less than three) should be maternity.	All primiparæ to be delivered in an institution, in addition to those recommended by Deptl. Ctee.
Anæsthesia.	Anæsthetist to be provided for abnormal cases free; at a fixed fee for normal cases.	Anæsthetist to be available when needed.	Available everywhere.	—
Consultant.	To be available when required.	Same as Deptl. Ctee.	Bad cases sent to "field" or "base" hospital.	Bad cases to be sent to primary or secondary centres by motor-ambulance.
Sterilised outfit.	To be provided when needed.	To be provided in every case.	—	—
Central organisation.	Scheme to be worked by existing doctors and midwives—with better education.	Same as Deptl. Ctee.	General directing ad hoc body representative of all concerned. Independent chairman. Reports direct to Minister of Health.	General directing ad hoc body with powers to train and discipline midwives. Representative of all concerned. Chairman: chief medical officer of district.

THREE TYPES OF HOSPITAL:

BLAIR BELL.

Base. Field. Casualty clearing.

BASE HOSPITAL.

At an existing general hospital in a university centre. Run by professor, coöperating with colleagues in university laboratories and at hospital. To be general, consultative, and specialist. To teach students and midwives. To have maternity and gynæcological beds. To cover area of 50 miles radius. Consultative antenatal, postnatal, and infant welfare clinics and beds.

FIELD HOSPITAL.

Large general hospital with maternity ward, clinical laboratory, and isolation block. To do antenatal, postnatal, infant welfare, and domiciliary work, in- and out-patients. To work in its immediate district, referring the worst cases to the base. Specialists, junior obstetricians, and general practitioners on the staff.

CASUALTY CLEARING STATIONS.

Cottage and small hospitals, one-quarter of their beds being for maternity. Liaison with base. Antenatal and postnatal beds.

NETWORK OF CLINICS.

(a) At base, run by experts, consultative.
(b) Scattered round base, associated with it, and run by junior experts and general practitioners.
(c) More remote, connected with field hospital or casualty clearing station, and run by general practitioners and pædiatrists.

MUNRO KERR.

Primary. Secondary. Subsidiary.

PRIMARY HOSPITAL.

At an existing maternity hospital in a university centre. Run by a professor, coöperating with colleagues in university laboratories. Senior staff allowed to do private practice. Staff resident as far as possible. To do normal cases and particularly emergency cases, and to be consultative and investigatory. To teach post-graduate students only. No postnatal or infant welfare work. Gynæcological beds and clinic, if possible. Antenatal clinic and beds.

SECONDARY HOSPITALS.

(a) Other hospitals in city where there is a primary. Independent, with full status, but not to take most difficult cases or emergencies. Teach midwives primarily. Do gynæcology, antenatal, postnatal, infant welfare, and domiciliary work. Staff similar to primary, but simpler.

(b) Towns with no primary centre. Hospital does ordinary obstetric work—antenatal, postnatal, and domiciliary—and simple gynæcology and laboratory work. In liaison with nearest primary by motor-ambulance.

(c) Cottage hospitals, staffed by general practitioners. Direct the antenatal, postnatal, and infant welfare work of district, and have beds for emergencies and antenatal cases.

SUBSIDIARY.

Antenatal, postnatal, and infant welfare clinics, and a domiciliary service under the local health authority. Each clinic associated with a particular secondary or primary. Run by general practitioners, public health officers, and pædiatrists.

work of an obstetric hospital. They would teach students and midwives, but their teaching would be primarily for midwives. They would hold antenatal, postnatal, and infant welfare clinics and have ante- and postnatal beds, and run a domiciliary service. They would also do gynæcology.

(*b*) Hospitals in towns or small cities where there was no primary centre. These would do ordinary obstetric work, provide antenatal and postnatal beds and clinics, simple gynæcology, simple laboratory work, and a domiciliary service. Their antenatal clinics would be consultative for the subsidiary centres.

(*c*) The cottage hospital would deal with emergencies and have antenatal beds, and direct the antenatal, postnatal, and infant welfare work of the area.

The first and second class would be staffed similarly to the primary hospital, but more simply, and the third class would be staffed by general practitioners.

Of these the second group corresponds fairly closely to Prof. Blair Bell's field hospitals, which would be large general hospitals containing maternity and isolation wards and a clinical laboratory, and carrying on antenatal, postnatal, infant welfare, and domiciliary services. They would be built on a standard plan adapted to local needs, and would work in their immediate districts, referring their worst cases to the base hospitals. They would be staffed by general practitioners and junior obstetricians.

Clinics and "Casualty Clearing Stations."—Finally, Prof. Munro Kerr would have a limited number of subsidiary centres in large towns or large rural areas. These would be antenatal, postnatal, and infant welfare clinics under the local authority, each associated with a particular primary or secondary unit. They would be the sorting-out and coördinating centres. They would have a secretarial department and a simple laboratory for urine testing. Records would be kept there and social services (home helps, accouchement outfits, &c.) would be arranged from them. The work would be done by general practitioners, public health doctors, and pædiatrists.

Prof. Blair Bell's "casualty clearing stations" correspond to (*c*) of Prof. Munro Kerr's secondary units—viz., the cottage hospitals. Prof. Blair Bell says that each of these should have one-quarter of their beds devoted to maternity, with a total of not less than three, and that they should run antenatal and postnatal work, referring difficult cases to the base hospital or getting help from there. He says that there should be one isolation centre in each district in the same town as the field hospital, in charge of the best obstetrician available. In addition, he would have a network of clinics, those at the base being consultative and run by experts, those scattered round the base being associated with it and run by junior experts and general practitioners, and those in remote districts being run by general practitioners or pædiatrists and being connected with a field hospital or a casualty clearing station.

Prof. Munro Kerr declares that it would not be satisfactory to have the clinics run by public health whole-time workers, and, although it might be tempting to have them run by the staff of an obstetric hospital, he feels that if this were once inaugurated the general practitioners would never get back again. On the whole, he thinks they should be run by practitioners, but he sees the disadvantage that practitioners in large cities would not be able to follow their institutional cases through a hospital.

THE DIRECTING BODY.

To run this scheme Prof. Munro Kerr would have a general directing ad hoc body with powers to train and discipline midwives. The body should be representative of all concerned—obstetricians, medical practitioners, medical officers of health, midwives, insurance commissioners, Ministry of Health, and local authority—and the chairman should be the chief medical officer of the Health Department. This corresponds fairly closely with the governing body suggested by Prof. Blair Bell, except that he would have the practitioners represented through the B.M.A., and the obstetricians through the College of Obstetricians, and would have an independent chairman. Prof. Blair Bell's great idea is to get the scheme under the control of the obstetricians, whereas Prof. Munro Kerr would associate it primarily with the Department of Health.

Prof. Munro Kerr's two great points are that obstetrics is a distinct entity, and, of all departments of medicine, the one most suited to have a service of its own, and that the present time is peculiarly opportune for inaugurating such a service, particularly on account of the Local Government Act, 1929.

AUSTRALASIA.

(FROM OUR OWN CORRESPONDENT.)

LOTTERIES, APPEALS, AND TAXES FOR HOSPITALS.

ECONOMIC conditions are making the financing of the public hospitals in New South Wales particularly difficult. Almost all these institutions depend on large annual Government subsidies, which in the past have been granted on the basis of £1 for each £1 contributed by the public. Not only have voluntary contributions diminished considerably, but the State Government have found it impossible to continue its subsidies on the former scale. The £1 for £1 subsidy has been discontinued, and each hospital receives subsidies at the discretion of a Hospitals Commission. In spite of strict economy and exploitation of every possible source of revenue, a number of hospitals have had to close wards. Recently, the Royal Prince Alfred Hospital, the largest hospital in Sydney, closed 200 of its beds.

The efforts of the State department to meet this extraordinary position have been interesting. Betting has always been a favourite source of revenue for the hospitals, and a percentage of the gross proceeds of the totalisators, which are found on all large racecourses in New South Wales, has always been reserved for them. When funds from this source showed a falling off the deficiency was countered by fairly heavy taxation on all bets made through bookmakers. This however, did not appear to give the anticipated return, and the next step was to make a change in the method of betting on the totalisator. Now, not only is it possible to bet for a place, but there is also a special "straight out tote" in which winnings are divided among the ticket-holders of the first horse only. This has resulted in a considerable increase in the turnover of the totalisator, and thus, indirectly, in the amount available for distribution to the hospitals.

Seeing that large sums of money are contributed annually from New South Wales to a private Tasmanian lottery, and to a government lottery in Queensland, it was not surprising that the State parliament, early in the year, passed an Act for establishing a New South Wales State lottery in aid of hospitals. This was opposed very strenuously by the Council of Churches, a body composed of representatives from most of the Protestant churches in New South Wales. The Council recommended a Church and State appeal, to which the Council would give its utmost support. The Premier agreed to this, but, it is understood, intimated that if it were not successful a lottery would be instituted. The appeal failed hopelessly, and the State lottery will be launched at a very early date. Tickets will be 5*s.* 3*d.* each, the first prize being £5000, and it is proposed to hold one every ten to fourteen days. It is estimated that a fully subscribed lottery should bring gross receipts for about £26,000, and that it will result in additional revenue of about £400,000 a year.

The Hospitals Commission, in its annual report, suggests a further source of revenue in the form of a special tax on motor vehicles—this although the population is groaning under a burden of taxation which is probably without equal anywhere else in the world. The reason given for the suggested tax is that, as motor vehicles are responsible for an increasing number of accidents, they should be made to pay their contribution towards the hospitals, which deal with their victims. It is estimated that 5 per cent. of the gross total of hospital days, for which all general cases were in hospital, were the result of motor accidents—that is, about 100,000 bed days per annum. It is recommended that an addition of 5*s.* should be made to the registration fee for each motor car, which would give a revenue of £55,000 per annum. From this it is proposed to recoup public hospitals to the extent of 7*s.* per bed per day for all motor accident cases admitted, and 5*s.* for attention to similar cases to out-patients. Further, 6*d.* would be paid for every mile actually travelled by ambulance transport cars for the purpose of conveying injured persons from the scene of the accident to the nearest public hospital.

ROYAL AUSTRALASIAN COLLEGE OF SURGEONS.

Now that the prefix Royal has been added to the title of the College, the name of the College of Surgeons of Australasia has been changed to the Royal Australasian College of Surgeons, and the latters signifying the Fellowship from F.C.S.A. to F.R.A.C.S. The word "Australasian"—which is at best somewhat vague and unsatisfactory—has been placed in the middle of the name, to avoid confusion with the Royal Colleges of Great Britain. The journal has altered its name to the *Australian and New Zealand Journal of Surgery.*

Although the college has been in existence but a few years, there are now two honorary Fellows, 391 Fellows, and 17 junior members, and at the recent fourth annual meeting, held in Sydney, 30 new Fellows were elected. A revision of the policy of future admission of Fellows is under consideration; it is suggested that each candidate, after he has obtained a senior surgical degree and has served the necessary period of surgical apprenticeship, should be interviewed by a board of censors, which should satisfy itself as to his surgical training and ability. At present the college is trying to obtain some uniformity in the M.S. degrees in the universities of Sydney, Melbourne, and Adelaide, and its efforts have met with a certain measure of success. Each university has agreed to some modification of its regulations for this degree, but they are still far from uniform, and likely to remain so. Adelaide and Sydney have adopted regulations which are for the most part similar, requiring the candidate to pass the first examination in anatomy and physiology (and, in Sydney, pathology), and a second examination, in which he may select a number of groups of subjects. These groups are, roughly: general surgery, obstetrics and gynæcology, diseases of the eye, and diseases of the ear, nose, throat, and larynx. Melbourne, on the other hand, has refused to grant an M.S. degree in the various specialties, for which it is substituting diplomas. At the recent annual meeting of the college it was decided to ask the University of Sydney to pass a regulation to the effect that candidates who passed a Primary Fellowship examination of the Royal College of Surgeons of England, might be exempted from Part I. of the examination for the M.S. degree. Although Melbourne has agreed to do this, it is thought unlikely that Sydney will agree. It is obviously of great importance to the college to obtain a uniform surgical standard of examination, and a number of Fellows think that the only satisfactory solution is for the college itself to hold examinations.

It is likely that the permanent building for the college will be in Melbourne. At the first annual meeting, held at Canberra, a site was granted there by the Federal Government for the erection of a building. Canberra, however, is not altogether suitable, because it is so far from all the executive members.

THE PRIMARY FELLOWSHIP EXAMINATION.

The Primary Fellowship examination of the Royal College of Surgeons of England begins at Melbourne on Aug. 11th. The following examiners have been appointed: Prof. William Wright, anatomy; Prof. G. A. Buckmaster, physiology; Prof. F. Wood Jones, assessor in anatomy; and Prof. W. A. Osborne, assessor in physiology. Associate Prof. H. S. Summers is superintendent of the examination, and Dr. W. A. Hailes is superintendent of dissections. Although the total number of candidates is not definitely known, there will probably be at least between 20 and 30. The present economic condition of the country will however prevent a number from sitting.

PARIS.

(FROM OUR OWN CORRESPONDENT.)

B C G STATISTICS UP TO DATE.

I SEEM always to be coming back to B C G, and by now, perhaps, some of your readers may wonder if your Paris correspondent has not got an *araignée dans le plafond* as far as this subject is concerned. But I am ready to wager all the gold you have sent us this last week or two that the historian of a century hence will say that the interest taken in B C G in France in 1931 surpassed the interest taken in all the other medical problems put together.

It will be remembered that an inquiry was addressed in January of this year to the tuberculosis dispensaries with experience of B C G vaccination in France. The answers from this source, together with other new statistical data, have now been collected by Calmette, who presented a report to the Academy of Medicine on July 21st. It deals with the period 1925–1930, and with the information obtained from 114 dispensaries, and from the medical practitioners and midwives of 42 departments. The first batch of figures, obtained from the 114 dispensaries, have been handled by Mr. Moine, the expert statistician, and they deal exclusively with the children born and brought up in tuberculous surroundings, and kept under the supervision of the dispensaries. Among the 8075 infants vaccinated, there were 89 who died within the first month of life and 581 who died (general mortality) in the course of the five years under review. There were 371 deaths among 2685 vaccinated infants between the ages of one month and one year, and 121 deaths among the 4811 vaccinated children between the ages of one and four years. Among the 579 vaccinated children over four years there were no deaths. The mortality of the vaccinated infants between the ages of one month and one year, born in tuberculous surroundings, was 4·7 per cent., whereas the general mortality of the non-vaccinated infants of the same age, living or not living in tuberculous surroundings, was 6·1 per cent. The mortality among the non-vaccinated infants, living in tuberculous surroundings, under the supervision of the dispensaries, ranged from 16 to 25 per cent. The information obtained from the 388 medical practitioners and midwives of 42 departments shows that 22,746 children have been vaccinated and kept under supervision. There were 174 deaths (a mortality of 0·7 per cent.) during the first month of life—i.e., before the vaccination could help in any way. There were also 408 deaths from all causes (a mortality of 1·8 per cent.) between the end of the first month and that of the fourth year. Commenting on these figures, Calmette described them as being more satisfactory than he had dared hope. He added that up to July 1st, 1931, some 354,000 children had been vaccinated with B C G in France alone.

FURTHER DATA ON B C G.

The first to give B C G to human beings were Dr. Weill-Hallé and Dr. Turpin, who, between 1921 and 1924 gave it by the mouth to 321 new-born infants. The subsequent careers of these juvenile pioneers of experimental medicine are, of course, of exceptional interest, not least to the physicians who took the risk of this particular step. In a communication to the Academy of Medicine on July 21st, Dr. Weill-Hallé presented a study of the comparative mortality among the infants given, or not given, B C G, in 182 families, which included 716 infants. The families were classified according as they were healthy, definitely tuberculous, or suspect. Within the first 12 months of life in healthy families there were 136 non-vaccinated infants with a mortality of 27 per cent., and 55 vaccinated infants with a mortality of 10 per cent. In the tuberculous families there were 175 non-vaccinated infants with a mortality of 29 per cent. (51 deaths within the first year of life), whereas among the 67 vaccinated infants the mortality was only 8·9 per cent. (six deaths). In the "suspect" families there were 215 non-vaccinated infants with a mortality of 37 per cent., and 68 vaccinated infants with a mortality of 16 per cent. Similar marked differences between the fates of the vaccinated and the non-vaccinated, in favour of the former, were found among the children over the age of one year.

THIRD INTERNATIONAL CONGRESS ON RADIOLOGY.

This Congress, held between July 26th and 31st, was attended by representatives from some 30 different countries. Madame Curie was elected honorary president, and the inaugural address was given by Prof. Forssel, of Stockholm, who chose as his subject the social campaign against cancer. The fact that more than 300 communications were addressed to the congress will give some idea of its importance. One of its tasks has been to pave the way towards international unification in radiology. To this end a commission has been appointed, on which the principal countries concerned are represented by experts in physics and medicine. An exhibition of the paraphernalia evolved from radiology was organised in the outskirts of Paris, at the Porte de Versailles, and it was amazing to see what a diversity of instruments and apparatus has grown out of this new science. Transportable devices figured prominently, and one of the most conspicuous was a large aeroplane provided with a special radiographic outfit to be used for the wounded who have fallen far afield, and for whom immediate transport is not feasible. The exhibition was open to the public free of charge, but one could not help wondering how this imposing array of highly technical specialties could do more than mystify and vaguely impress the ordinary sightseer.

MEDICINE AND THE LAW.

A Question of Age.

If an Act of Parliament refers to "a man of 23 years of age or under," do the words cover a man of 23½? The question has so puzzled the Court of Criminal Appeal that the number of judges had to be increased from three to five in order to obtain a solid decision; in the end the decision, though adequate, was not definite. The disputed words occur in the Criminal Law Amendment Act of 1922. A previous Act of 1885, dealing with the offence of carnal knowledge of a girl between 13 and 16 years of age, allowed an accused person to escape conviction if he could establish that he had reasonable cause to believe that the girl was of or above the age of 16 years. In 1922 this possible defence was abolished; in its place a different proviso was added—namely, that "in the case of a man of 23 years of age or under" the presence of reasonable cause to believe the girl to be over the age of 16 years should be a valid defence on the first occasion on which he was charged with this particular form of crime. This proviso to Section 2 of the Act of 1922 was an improvised piece of amateur draftsmanship. To speak of a girl as "of or above the age of 16 years" is perfectly clear; to speak of a man as "of 23 years of age or under" is ambiguous. A man charged with this offence at Huntingdon Assizes was found to have committed it in March, 1930. He was born on Sept. 26th, 1906, so he had passed his 23rd birthday on the day of the offence and had not yet reached his 24th. Mr. Justice Avory, at the trial, held that the accused was too old to avail himself of this statutory defence. The same ruling had been given in R. v. Dumont last year. In the Court of Criminal Appeal the appellant's counsel said a man was "of 23 years of age" until he reached 24. Counsel for the Crown argued that there were three categories—"under" 23, "of" 23, and "over" 23; all these were referable to a definite standard of time, the attainment of the 23rd birthday. The Court allowed the appeal on the broad principle that, when an equivocal word or ambiguous sentence leaves a doubt of its meaning which the canons of interpretation fail to solve, the benefit of the doubt should be given to the subject and against the Legislature, which has failed to explain itself. Even now, therefore, we do not know what the disputed words mean. We are merely told that they are so justifiably disputed that it would not be fair to use them to put anyone in prison. In effect, therefore, a "man of 23 years of age or under" means a man under 24.

The decision hardly seems one of those where fresh legislation is required in order that the law may be brought into line with what Parliament may be supposed to have intended. The reformers, in 1922, were disinclined to accept any proviso, but they were pressed with arguments that the law should not multiply the opportunities of blackmail. Parliament, it was said, should be slow to make a criminal of a young man who might be honestly misled as to a girl's age; in the matter of dress and the wearing of the hair, distinctions between the ages of 15 and 17 were nowadays negligible. In R. *v.* Dumont the girl was 15 years and 9 months old; she had told the defendant she was 19; the Recorder of London at the trial said she looked at least 17. In the 1922 Act the reformers' main object was to punish the offences of old men with young girls; from this point of view there is little difference between 23 and 24.

Cremation—the Medical Attendant's Certificate.

A rather insignificant printing error, in the form of the "Certificate of Medical Attendant" (Form B) in the Cremation Regulations, may have caused a disproportionate amount of trouble to the practitioner. The original Regulations, made in 1903, prescribed, in Form B, the following question and direction:—

> 9. What was the cause of death? { Primary.
> Secondary.
> (Specify the disease, injury, &c., and if possible distinguish the primary from the secondary cause as in the Death Certificate.)

In 1920 the Regulations were reissued without alteration to this passage. Six years later, the amending Births and Deaths Registration Act enacted that every certificate of cause of death required to be given by Section 20 of the 1874 Act should be "in the prescribed form"; the "Form of Medical Certificate of Cause of Death," subsequently prescribed in the Third Schedule to the Registration (Births, Stillbirths, Deaths, and Marriages) Consolidated Regulations, issued in 1927, speaks of "immediate cause," but omits all reference to the former classification of "primary" and "secondary." Last October new Cremation Regulations were made. The new Form B contains the old question 9 ("What was the cause of death?"), but adds thereto new requirements of information to conform with those on death certificates; the practitioner must now specify "immediate cause," "morbid conditions . . . giving rise to immediate cause," and "other morbid conditions (if important) contributing to death, but not related to immediate cause." But, though the old classification of "primary" and "secondary" has thus disappeared, by some oversight the words "primary" and "secondary" have been left in the form as they appeared on bracketed lines in the original Regulations of 1903. The unexplained retention of these two words must have puzzled many certifying practitioners, but need do so no longer. The Home Office, it is understood, is taking steps to delete the otiose words and to explain that they were printed in error.

PANEL AND CONTRACT PRACTICE

RANGE OF SERVICE.

SOME months ago, at a meeting of the insurance committee for the County of London, doubts were cast upon the competence of the committee, consisting as it does of a majority of lay members, to express an opinion on medical questions. The point specially concerns "range of service" cases; laymen must find it hard to decide a question whether an operation or other service advised for, or rendered to, a patient by a practitioner is within the scheme of the practitioner's obligations under the Terms of Service, or whether it involves special skill and experience such as general practitioners as a class cannot reasonably be expected to possess. Under Article 43 of the Medical Benefit Regulations a "range of service" question must be submitted to the local medical committee. If the local medical committee and the insurance committee disagree, the question must be submitted to referees; if they agree it may still be referred to referees by the Minister. In order to place these cases in the clearest possible way before the insurance committee within Article 43, the London medical benefit subcommittee now puts them forward with a definite recommendation that the insurance committee be invited either to agree or to disagree, as the case may be, with the local medical committee. Not only does this procedure comply more exactly with Article 43; it also helps to simplify for laymen, and possibly to limit, discussion of a medical matter.

We note that lately the London insurance committee was invited to disagree (and did disagree) with the local medical committee's opinion that the treatment of varicose veins by injection involved special skill and experience such as general practitioners cannot reasonably be expected to possess. The decision conforms with that of the referees in the Kent and Leicestershire cases mentioned in this column a fortnight ago. On the other hand, the insurance committee agreed with the local medical committee's opinion that the following were services requiring such special skill and experience and justifying the charging of a fee within Clause 10 of the Terms of Service: Refraction for myopia and for presbyopia, refraction under mydriatic for astigmatism and for hypermetropia, ultra-violet rays for neurasthenia, septic tonsils dissected out, and tonsillectomy. Another operation for which a fee was allowed was the incision of a swelling in the middle line of the neck. The patient had suffered from suppuration of one of the deep cervical glands of the anterior triangle of the neck; this necessitated a general anæsthetic and careful dissection in order to expose the gland, which was then incised and a rubber tube inserted. The two committees agreed that this required special skill and experience.

HEALTH INSURANCE IN SWEDEN.

The reform Bill rejected by the Riksdag in 1930 has now passed both legislative chambers. The system of health insurance set up by it will, however, not come into force until 1935, and as regards medical benefit not till 1938. The new powers make it possible to use sickness funds for purposes other than health and maternity insurance, and the National Labour Office says[1] that the measure is regarded in many quarters as a step towards compulsory health insurance. At present the principle of voluntary insurance is retained but an organisation is set up to prevent the overlapping of funds; the State subsidy is increased, and both sickness and maternity benefits are larger in cash and in kind. An order has been issued requiring insurance institutions to administer the payment of State relief intended primarily for women of small means who are not members of a recognised sickness fund. Uninsured women who cannot meet the expenses connected with their confinement are entitled to an allowance of one krona a day for thirty days, which can be increased to 56 days in the case of women employed in industrial undertakings.

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[1] Industrial and Labour Information, August 3rd, p. 165.

CORRESPONDENCE

RETIREMENT OF DR. STEVENSON.

To the Editor of THE LANCET.

SIR,—We do not wish the retirement of Dr. T. H. C. Stevenson from his official work at the General Register Office to pass without an expression of our deep regret on the event, and of our appreciation of his public services.

Of Dr. Stevenson's contributions to the scientific journals we shall say nothing, except that these would have sufficed to secure a permanent place for him in the history of statistical science. The searching and illuminating discussions of the problems of vital statistics which he has contributed to the census reports and to the annual and decennial reports of the Registrar-General have formed noteworthy landmarks in the study of our national records. Dr. Stevenson's remarkable analysis of the data of the census of fertility, taken in 1911, was a tour de force, while the essays contributed by him to the annual reports of the Registrar-General make a wider appeal and, in our judgment, place Stevenson second only to William Farr amongst those public servants who have secured for England her proud position in the realm of official vital statistics. His studies of the factors of infant mortality, of the local distribution and evolution in time of mortality from tuberculosis, and of the interpretation of the statistics of cancer mortality, especially in relation to its local incidence in the human body, are further examples of immensely important medical research. Dr. Stevenson first demonstrated, upon adequate data, the contrasting rates of mortality of single and married women from cancer of the breast and reproductive organs. This and his more recent studies of the variation of cancer mortality with social status constitute probably the most important statistical contributions yet made to our knowledge of malignant disease.

In these, as in many other instances, Dr. Stevenson approved himself a worthy successor to Farr, and there has been secured that continuity of research into medico-social problems of which the Registrar-General's records form an almost unlimited storehouse. We offer this imperfect tribute to the merits of a great public servant in the hope that our readers may reward him in the way he would most value—by studying these records of first-rate investigation for themselves, and be stimulated to similar inquiries based on our scantily used records.

We are, Sir, yours faithfully,

DAWSON OF PENN.
MOYNIHAN.
J. C. STAMP.
ARTHUR NEWSHOLME.
MAJOR GREENWOOD.
G. UDNY YULE.

August 8th, 1931.

IMPRISONMENT FOR MENTAL DISORDER.

To the Editor of THE LANCET.

SIR,—Your readers may remember a letter from Dr. Frederick Dillon[1] drawing attention to the case of a lad who had accused himself of murder, and, after the police had searched in vain for the corpse, been discharged with a warning not to do it again. Dr. Dillon pointed out the risks attached to the absence of psychological investigation of such a case, and the validity of his contention was shown when the same youth later reappeared in court after an attempt at arson.

A similar need of psychological investigation is exemplified in to-day's papers. A young man, said to be the owner of a flourishing business, was sentenced at Hove police-court to 14 days' hard labour for the theft of a motor-cycle. His behaviour had been extraordinary, and apparently inexplicable, and the defence—carried on by his relatives without legal or medical aid—was "loss of memory." The newspaper accounts show that both the Mayor of Hove, who tried the case, and his clerk made kindly—but, of course, unsuccessful—efforts to obtain from the man an explanation of his conduct, and there seemed no alternative to imprisonment. The descriptions accord with a typical fugue state, which apparently still continues, and urgently demands skilled handling, but no one in connexion with the case seems to have had any conception of such a possibility. Nor would there be any certainty of more understanding if the man had been remanded for medical examination; for how many of us are sufficiently acquainted with modern psychological principles and technique to understand a fugue state? It would be wrong to blame the police or bench, and on the legal aspects of the case I can offer no opinion; yet, if my hypothesis is correct, it is distressing to think of this man being placed in prison with no hope of his mental condition being recognised or treated.

I am, Sir, yours faithfully,

London, W., August 7th, 1931. MILLAIS CULPIN.

TRAVELLING IN RUSSIA.

To the Editor of THE LANCET.

SIR,—It is only fair to warn any scientific man—especially a medical man—who proposes to go on a scientific tour organised by the Society for Cultural Relations with Soviet Russia to make sure in London before leaving that he will see that class of subject which interests him, because he will be on a "conducted" tour, where many names are called out, and where he is hurried from place to place. This, though interesting, does not deal with any particular subject. So far, I have seen nothing (according to programme) of medical interest. Though a medical man, starting with an assurance that I should see subjects of medical interest, especially, I am allowed to see only plants and laboratories, and to meet men with long and unpronounceable names, who have no connexion with medicine. Possibly things may be better later, but as we have no programme I cannot be sure. There was a programme, but it was not adhered to.

If there are any so-called "eminent" men in the party, even though in the minority, their subjects are attended to. The wishes of the majority count for nothing, and it is an extremely arduous and rough tour. Hence, unless the tourist's interests are similar to those of the big men the tour may not be worth it.

Beyond that, if interested in seeing what the country is doing, the tourist will have a very interesting time indeed. So far as culture goes, he can get far more in London. The S.C.R. looks after the tourists extraordinarily well, and with extreme patience. "Intourist" (the Soviet organisation for touring parties) gives no assistance whatever, except to the big men, and I can get no information of routes, costs, or anything from it.

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[1] THE LANCET, 1930, ii., 776.

I am, Sir, yours faithfully,

W. F. COOPER, M.R.C.S., L.R.C.P.
(Kingston Hill, Surrey).

August 3rd, 1931.

THE ADEQUATE TREATMENT OF SYPHILIS.

To the Editor of THE LANCET.

SIR,—I fear that by the time this reaches you the interest aroused by the discussion in your columns on the adequate treatment of syphilis may have evaporated. Certain aspects of the subject appear to me to be so important that I trust you will allow me a little of your valuable space.

With all respect, I am of opinion that the divergence of views expressed in the letters of Colonel Tyler Burke, Colonel Harrison, Mr. David Lees, and others is of little moment. Their letters suggest that there is a wholesome dread of arsenicals being likely to cause neuro recurrences, and claims are made that by the simultaneous or alternate administration of bismuth or mercury, or both, these risks are avoided.

The essential point is that the statistics given are not concerned with the end-results. I had the Medical Research Council's paper, No. 132, sent out to me in the hope that I should find some help and guidance, but was disappointed to find that it could give me no assistance.

In the early part of this year a three-day conference was held in Nairobi by the Kenya Branch of the British Medical Association to consider syphilis, and I was requested to open the discussion on treatment. I found myself in a very difficult position. I had to ask myself whether I could conscientiously advise an intensive campaign on the lines prescribed by the V.D. authorities in England, or should I rest satisfied with suggesting that attention should only be given to obviously contagious cases and to women who had had miscarriages which could be attributed to lues. I felt obliged to join issue with the controversialists and panicmongers, who write as if syphilis *remains* an infectious disease. No one with adequate experience doubts that infectivity does disappear. I am not forgetting that Warthin says that he has never found a case of cured syphilis at autopsy, but collections of spironemata in the aorta or meninges are a source of danger only to the patient. The Wassermann and other serological reactions are of little help, for contagion is present before there is a serum change, and positive reactions are present when the stage of infection has passed.

In this colony syphilis in the African is a mild disease. Tabes and G.P.I. are exceedingly rare, and Vint, in Kenya, and Webb and Holliday, in Uganda, have shown that aortic disease and aneurysm are much less common than in Europe. It may be taken for certain that few, if any, African patients have completed a course which the high authorities mentioned would consider "adequate," and a huge number of luetics have had no treatment at all. Yet the clinical results, so far as they can be ascertained, appear to be very close to those found byBruusgaard in his analysis of the patients under the care of Prof. Cæsar Boeck, from 1890–1910, who were permitted to combat the disease solely by their tissue reactions, without any specific treatment. This analysis was made from 1925–1927.

Permit me to recall some of Bruusgaard's figures. He traced 471 of Boeck's patients. Of these, 164 had died. One-third of the fatalities were caused by pulmonary tuberculosis and cancer; 25 per cent. had succumbed to cardiovascular disease (a very large majority of these being between 40 and 60 years of age). There were only five deaths from G.P.I. and tabes. Of the 307 survivors, no fewer than 200 were symtom-free. Of these, 68 gave a positive Wassermann. My dilemma can be appreciated, and I finally decided that until we have end-results of cases "adequately" treated by modern methods it was impossible to make a dogmatic statement. It is now more than 20 years since "606" was introduced, and the time is ripe to start a systematic follow-up. If we can get accurate statistics of the fate of 1000 patients the subject will be in a very different position. In every case the condition of the cardiovascular and central nervous systems must be evaluated by experts. A serologist will also be necessary. These workers should be selected by the Medical Research Council, and should be free from the routine duties of a V.D. clinic.

Such statistics as are contained in Paper 132, and others referred to in the discussion, are of little interest outside the clinics where they were collected. We all know that early involvement of the central nervous system occurs, as amply proved by Parnell and Fildes, at Haslar, early in the war. Most of us know, however, that it is unlikely that G.P.I. or tabes will occur within the period of the observations of Colonel Harrison's assistants, and others. This is amply proved by a study of Bruusgaard's patients, who were observed up to 20 to 30 years after their infection. The same holds good in respect of cardiovascular disease.

Probably some of the statistics now available may be made the starting-point of the follow-up inquiry. If this were not so one could only regret that so much time and expense had been lavished upon them. Paper 132 is a case in point. Surely, it is unnecessary to investigate the occupation of male patients—in them, at least, syphilis is not an occupational disease—and the prevalence of congenital lues in paintmakers, photographers, or pianoforte-tuners has not even a sociological interest. But I suppose even the M.R.C. nods sometimes.

I am, Sir, yours faithfully,

JAMES H. SEQUEIRA, M.D.,
F.R.C.P. Lond., F.R.C.S. Eng.

Kenya Colony, B.E.A., July 15th, 1931.

RECOVERY FROM STREPTOCOCCAL SEPTICÆMIA.

To the Editor of THE LANCET.

SIR,—I am quite sure that Dr. Ryle and myself are in complete agreement as to our aims. They are accurately stated and the position well summarised in your leading article on p. 252 of the issue in which his letter appears. Dr. Ryle has laid stress on clinical symptoms in a disease which I consider requires more investigation bacteriologically before we can correlate the symptoms and the nature of the bacterial infection. For instance, I am well aware that one or more of the symptoms which Dr. Ryle has called "a diagnostic syndrome," may occur in hæmolytic streptococcal infections, but before applying the term syndrome it is necessary to prove that the symptoms occur *collectively* in a large percentage of the cases. Within the last few weeks I have had two fatal cases of septicæmia. Neither had a single symptom of the syndrome, yet each had hæmolytic streptococci in the blood stream. Unless emphasis is laid on such cases as these we shall not get a blood culture and a complete bacteriological examination made in every case of continued fever, which is the point which Dr. Ryle and I are both trying to insist upon.

If Dr. Ryle objects to my utilising the Guy's Hospital figures of six recoveries out of 21, because some of the patients had other grave diseases, I would refer him to the statement in his own article, that, after elimination of the five cases in which septicæmia complicated another disease, two-thirds of the remaining group died. This was enough to warrant the only conclusion we drew, viz., the high fatality-rate of streptococcal septicæmia. Obviously, the death-rate in a large hospital gives a more accurate representation of the death-rate generally than does a series of nine cases taken from a consulting practice.

Dr. Ryle now states that his conclusions with regard to sera were mainly in respect of the ordinary polyvalent serum. If by this he means the unconcentrated serum, it should be made quite clear that his warning with regard to crippling serum-sickness was only meant to refer to this unconcentrated serum, and does not apply to the concentrated sera which are now available, and which, with ordinary precautions, can be given, and are given, in large doses without deleterious effect.

I am, Sir, yours faithfully,
A. H. G. BURTON.

Public Health Offices, Ilford, August 7th, 1931.

VEHICLES FOR CHEMICAL CONTRACEPTIVES.

To the Editor of THE LANCET.

SIR,—Your annotator on chemical spermicides (p. 257) would find much about the effects, knowledge of which he considers desiderata, in my book, "Contraception: Its Theory, History, and Practice." While something was said therein of the value of the greasy vehicle in contraceptives in the earlier edition, much more has been added in the greatly enlarged and reset edition, which appeared at the beginning of July, and to which it is extraordinary no reference is made either by your annotator or in Dr. Baker's letter.

Dr. Baker suggests that "the superiority of cocoala as a vehicle for chinosol is evident." Is this "a new fat," as Dr. Baker states? If this is the proprietary preparation which has long been known to those concerning themselves with the practical side of contraception, a sad disillusionment awaits the members of the medical profession who take Dr. Baker's assumption of its superiority without clinical test.—I am, Sir, yours faithfully,

MARIE C. STOPES,
President of the Society for Constructive Birth Control and Racial Progress.

Hindhead, Surrey, August 11th, 1931.

*** A review copy of the third edition of Dr. Marie Stopes's book (London: G. P. Putnam's Sons, pp. 487, 15s.) reached us on July 15th. A considerable amount of matter, devoted in the earlier editions to propaganda, has been omitted from this edition, and much interesting information is added upon recently popularised contraceptive methods. The author adheres to her original view that the best available method for normal and healthy women is the rubber cervical cap. For women suffering from uterine displacements and abnormalities of the cervix she recommends a flat rubber sponge, some three-quarters of an inch thick, soaked in olive oil, which the woman is advised to boil for two minutes in salt water after use.—ED. L.

CANCER-PRODUCING SUBSTANCES.

To the Editor of THE LANCET.

SIR,—In view of certain statements which have appeared in the press, the authorities of the Cancer Hospital (Free), Fulham-road, wish to state that no announcement of any kind referring to cancer-producing substances has been issued from this hospital since their official report to the British Empire Cancer Campaign, which was presented at the annual meeting of the Campaign on July 20th. In this report (pp. 33–42) no claim is made that the cancer-producing substance present in tar has been identified.—I am, Sir, yours faithfully,

J. COURTNEY BUCHANAN,
Secretary.

Cancer Hospital, Fulham-road, London, S.W., August 12th.

*** Recent work at the Cancer Hospital on carcinogenetic substances was noticed in an annotation on p. 197 of our issue of July 25th.—ED. L.

THE SERVICES

ROYAL NAVAL MEDICAL SERVICE.

Surg. Lt.-Comdrs. G. Kirker to *Durban*; J. Hamilton to *Britannia*; and J. Cusson to *Sandwich*.

Surg. Lt.-Comdrs. (D.) A. MacPherson to *Victory*, for Haslar Hosp.; A. Lawrey to *Ganges*; and R. R. Adams and R. S. Ward to *President*, for three months' dental post-graduate course.

Surg. Lt. (D.) H. V. Pell to *Victory XI.*, for R.N. Hosp., Portland, tempy.; F. J. Goldsworthy (actg.) to *Vivid*, for Devonport Barracks; and J. C. Benson (actg.) to *Victory*, for Portsmouth Barracks.

ROYAL ARMY MEDICAL CORPS.

Maj. and Bt. Lt.-Col. T. J. Mitchell retires on retd. pay and is granted the rank of Lt.-Col.

Maj. (temp. Lt.-Col.) F. Casement to be Lt.-Col.

Maj. E. M. Middleton to be temp. Lt.-Col.

Lt. J. W. Kendall to be Capt. (prov.).

ROYAL AIR FORCE.

Flying Officer E. W. B. Griffiths is promoted to the rank of Flight-Lt.

INFECTIOUS DISEASE

IN ENGLAND AND WALES DURING THE WEEK ENDED AUGUST 1ST, 1931.

Notifications.—The following cases of infectious disease were notified during the week:—Small-pox, 26 (last week 30); scarlet fever, 1416; diphtheria, 831; enteric fever, 60; pneumonia, 401; puerperal fever, 37; puerperal pyrexia, 114; cerebro-spinal fever, 31; acute poliomyelitis, 13; acute polio-encephalitis, 1; encephalitis lethargica, 14; dysentery, 24; ophthalmia neonatorum, 109. No case of cholera, plague, or typhus fever was notified during the week.

The number of cases in the Infectious Hospitals of the London County Council on August 4th–5th was as follows: Small-pox, 51 under treatment, 2 under observation (last week 58 and 2 respectively); scarlet fever, 1216; diphtheria, 1481; enteric fever, 12; measles, 147; whooping-cough, 379; puerperal fever, 35 (plus 4 babies); encephalitis lethargica, 211; poliomyelitis, 1; "other diseases," 130. At St. Margaret's Hospital there were 15 babies (plus 6 mothers) with ophthalmia neonatorum.

Deaths.—In the aggregate of great towns, including London, there was no death from small-pox or enteric fever, 18 (2) from measles, 4 (1) from scarlet fever, 16 (3) from whooping-cough, 22 (4) from diphtheria, 41 (10) from diarrhœa and enteritis under two years, and 11 (0) from influenza. The figures in parentheses are those for London itself.

Four of the deaths from measles were reported from Barnsley; 4 of those from whooping-cough from Liverpool. Diarrhœa was credited with 5 deaths at Liverpool; 4 at Manchester.

The number of stillbirths notified during the week was 275 (corresponding to a rate of 40 per 1000 births), including 57 in London.

PUBLIC HEALTH SERVICES

PORT SANITARY AUTHORITY.

Dr. W. F. Dearden, in his twenty-fifth annual report to the Manchester Port sanitary authority, mentions that no case of cholera, plague, or yellow fever appeared, that three cases of scarlet fever were removed to hospital, and that single cases of malaria, dysentery, pneumonia, and tuberculosis were treated on board. One child, with scarlet fever, was sent to hospital from a canal boat. On board ships 915 rats were destroyed (the average number per ship was 2½ in 1930, 5½ in 1929, so rats are decreasing on ships), and 2332 on shore; 31 examined were found free of plague. Of the 877 tons of food condemned, 682 were apples, mostly on account of "brown heart," being death of tissue from interference with respiration. Inspection of 1976 ships showed that 502 had defects, 116 forecastles requiring cleaning and painting. There were 85 defects in water-closets, 76 in ventilation, 81 in lighting, 50 in heating, 57 in water storage, while 33 forecastles were verminous. Defects were more numerous in British (30 per cent.) than in foreign ships (15). The crews of vessels inspected averaged 26 men. The chief reported defects in canal boats were leakages into cabins. Like other port medical officers, Dr. Dearden finds better accommodation for seamen on foreign ships than on British ships, especially on new vessels. Having examined 88 British ships and 52 foreign, all built since 1926, he found that the crews' quarters were aft in 76 per cent. foreign, but only in 42 per cent. British; there were washplaces and bathrooms in 76 per cent. foreign and 55 per cent. British, messrooms and hospitals in 94 per cent. foreign, and in barely half of the British ships, the reason being that improved accommodation is compulsory abroad, but at home is recommended only by the Board of Trade, which has no power to compel compliance. It is said, he remarks, that shipping cannot stand fresh financial burdens, but (he asks) would burdens be materially increased if ships were properly planned from the start, and, alternatively, if burdens are thus increased, how do the ships of small nations bear them and still compete with our shipping, which escapes them? He hopes the Board of Trade and Ministry of Health will combine to get statutory authority to make regulations requiring a certain type of accommodation for sailors on British ships. At the same time, suitable water storage should be ordered, and sanitary dust-bins for ships in dock, not coal-burning, and so unable to dispose of their own kitchen refuse. Shipowners and others have recently been conferring about crews' living quarters, and a month ago the President of the Board of Trade stated that the Board would take such action as lay within its power to give effect to their recommendations. If we have correctly understood Dr. Dearden's report, that will leave matters precisely where they are.

MENTAL HOSPITAL REPORTS.

The City of Cardiff Mental Hospital had 749 patients in residence on the first day of this year. The death-rate for the year was 7·7 per cent., and the recovery-rate 39·9 per cent., despite the high percentage (21·7) of admissions for general paralysis—accounted for by the high incidence of syphilis in the seaport. The general health was good, and there was no infectious disease, except one case of scarlet fever, one of erysipelas, and four of tuberculosis. All new female cases were discussed with the gynæcologist, and those whose symptoms pointed to any gynæcological condition were examined by him. A large number of patients were submitted to routine ear, nose, and throat examination, and a certain amount of sepsis was discovered and removed, without, however, any very striking psychical improvement. The dentist attended regularly throughout the year and examined over 500 patients. The consulting surgeon performed three major operations. In the biochemical laboratory a number of interesting pieces of research are being carried on, including work on the carbohydrate and nitrogen metabolism of the psychotic, the psycho-galvanometer, oxidation in the brain, somatic changes, the blood coagulation time, and gynæcological and menstrual conditions in the psychoses. Malarial therapy has been continued, and the results show a discharge-rate of 33·3 per cent. and a benefit-rate of 46·9 per cent. Continuous baths and ultra-violet light treatment have been used together and have seemed to enhance each other. The occupational therapy department has been kept busy. The best occupations officer, in the opinion of this hospital, is the mental nurse with a knowledge of arts and crafts. Some 80 per cent. of the women and 70 per cent. of the men are employed in useful tasks. All ground-floor wards are administered on the open-door principle, and patients in non-observation wards now do not go to bed until 9 P.M., after a light supper. There are 76 men and 111 women on parole, and during the year 162 patients were granted leave of absence on 1374 occasions. After-care work is carried on in coöperation with the Cardiff League of Social Services, but the Medical Superintendent looks to the day when the hospital will have its own full-time social worker. The out-patient clinic at the Cardiff Royal Infirmary has had to open a second weekly session; 82 new patients attended last year. Two unqualified resident clinical assistantships are now available for final year students, and this experiment has proved a great success. During the year five nurses obtained the final certificate of the General Nursing Council. This hospital is in the enviable position of always having a waiting list of suitable applicants for probation.

The East Riding Mental Hospital at Beverley had 610 patients under care on March 31st last. The recovery-rate for the preceding year was 25 per cent., and the death-rate 8·54 per cent. Autopsies were performed in all cases where permission was given—i.e., 96 per cent. Confusional and excited cases are treated by hydro-therapeutic methods with very satisfactory results, and general paralytics, who fail to respond to tryparsamide, are treated with malaria. The dental surgeon visits regularly and examined 161 patients during the year. Parole was granted to 46 patients. A laboratory has been established and equipped, and arrangements have now been made to house the mentally defective children elsewhere. Plans for a new nurses' home have been approved. The staff consists of 39 men, 21 of whom hold the R.M.P.A. certificate, and 38 women, of whom four are certificated.

The Hereford County and City Mental Hospital at Burghill housed 545 patients at the end of last year. The recovery-rate for the year was 25 per cent., and the death-rate 5 per cent.; post-mortem examinations were held in 59 per cent. of the fatal cases. The visiting dentist extracted 363 teeth. The general health was good, and there was no infectious disease, except two cases of erysipelas and one of diphtheria. Parole within the grounds is granted to 29 men and 11 women, and six men are allowed outside the estate. One male and two female wards are "open door," and periods of trial are practically always given before discharge, though not very often with a money allowance. Of the nursing staff of 72, 11 men and 14 women are certificated or registered, but considerable difficulty is experienced in procuring candidates.

At the Joint Counties Mental Hospital for the Counties of Carmarthen, Cardigan, and Pembroke there were 652 patients on March 31st last; the hospital is overcrowded. The recovery-rate for the year was 33·3 per cent., and the death-rate 11·9 per cent. The general health caused some anxiety, as influenza was very prevalent, and there were 19 cases of diarrhœa or enteritis, 6 of tuberculosis, and 23 of peripheral neuritis—the cause of which is still obscure. The dentist visits weekly, and treated 160 patients, but the absence of electricity in the institution deprives the patients of many modern methods of treatment. A new hot-water system has been installed, and a new verandah is being built. The visiting commissioners urge the advisability of allowing more patients out on trial before discharge, and of granting money allowances. A laboratory is to be fitted up. Two nurses passed the final examination for the R.M.P.A. certificate during the year.

There were 796 men and women on the books of the **DOWN COUNTY MENTAL HOSPITAL** at **DOWNPATRICK** at the end of last year. The recovery-rate for the year was 31·1 per cent., and the death-rate 7 per cent. An electro- and hydro-therapeutic equipment is to be added to the hospital, and occupational therapy has already developed considerably, 60 per cent. of the patients being usefully employed. Stress is laid on the manufacture of useful articles, tweeds and linen, for instance. Seventy members of the nursing staff hold the R.M.P.A. certificate.

The **MONMOUTHSHIRE MENTAL HOSPITAL** at **ABERGAVENNY** had 1206 patients on its register at the end of last year. This hospital is one of the few in which the male patients outnumber the female. The recovery-rate for the year was 35·3 per cent., and the death-rate 6·3 per cent. There was no outbreak of infectious disease, but sporadic cases of chronic dysentery and tuberculosis came under care. An out-patient clinic has been established at the Royal Gwent Hospital, at Newport, and 84 new patients were treated during its first year of work. The Medical Superintendent hopes that Maindiff Court will soon become a modern admission and convalescent villa in the sense of the new Act. Plans for a nurses' home have been submitted to the Board of Control. The dentist visited weekly, and extracted 249 teeth during the year. The visiting surgeon was called in consultation ten times, and performed eight operations. Fifty-six men are allowed parole beyond the estate, and 85 men and 26 women are free within the grounds. An X ray apparatus has been installed, and general paralysis is to be treated by induced malaria. Of the 152 members of the nursing staff, 39 men and 20 women are certificated or registered, eight having passed the final examination for the nursing certificate during the year.

PRIVATE MENTAL HOSPITALS.

The report of **THE RETREAT, YORK**, is illustrated, as usual, by charming pencil drawings. During the year 116 patients were admitted, 110 discharged, and 20 died, the number on the books on Dec. 31st, 1930, being 206. Of those admitted during the year, 64 per cent. were on a voluntary basis. The recovery-rate was 37·8 per cent., and the death-rate 8·5 per cent. The Medical Superintendent, in common with every one of his colleagues this year, discusses the Mental Treatment Act, but, in addition to his welcome of the measure, he expresses considerable disquietude at the lack of alteration in the popular attitude towards the mentally ill. As far as he can see, recognition of the modern trend of thought is only made by those most intimately concerned, and there is serious need for a rapid change in the popular conception of mental illness and its treatment. The general health at the Retreat during the year was very satisfactory. The occupational therapy department, under its whole-time instructor, provides every kind of work, and is gathering more and more patients into its happy activity. A seaside house was again taken for the summer. A seven-seater motor-car has been bought to take patients for excursions into the country; it is in regular use every morning and afternoon. Garrow Hill is being altered to form a nursing home, to be run in connexion with the Retreat. The visiting commissioners suggest the installation of an X ray apparatus. Six gentlemen and 12 ladies have parole beyond the grounds, and seven gentlemen and 16 ladies within the grounds. During the year three nurses passed the final examination of the General Nursing Council. Nine female nurses are employed nursing male patients.

The 104th annual report of **JAMES MURRAY'S ROYAL ASYLUM, PERTH**, illustrated by photographs, records a successful year of progress. There were 178 patients on the register on March 31st last, the ratio of voluntary to certified patients admitted being 40:24. The new detached hospital block—Gilgal Hospital—has been completed and is now open for voluntary patients, suffering from slight or brief neuropathic or psychopathic disorders, who are sensitive or apprehensive about association with invalids of a different type. The building has been equipped in the most modern style. Each ward unit consists of a dormitory with 8 to 11 beds, a day room, dining room, six private rooms, three observation private rooms, two bath rooms, with a continuous bath, a clinical treatment room, a verandah, and offices. The death-rate at the James Murray's institution last year was 8·1 per cent., and post-mortem examinations were made in five out of the 14 cases. Of the 50 patients discharged during the year, 21 were recovered and 26 relieved. The damage done by the fire in April, 1930, has now been made good, and the whole system of water-mains has been renewed. The commissioners comment with gratification on the amount of parole allowed. During the year four nurses and two attendants obtained the R.M.P.A. certificate, and three nurses and one attendant passed the final examination of the G.N.C. The hospital has reluctantly abandoned the examinations of the R.M.P.A., as that certificate does not entitle the holder to a place on the State register.

At **BARNWOOD HOUSE, GLOUCESTER**, there were 139 certified patients and 17 voluntary boarders on Dec. 31st, 1930. The hospital has been very full on the female side, but there have been fewer men admitted than during previous years. Had there been more accommodation there would probably have been many more voluntary patients. The recovery-rate for the year was 57·7 per cent., and the death-rate 5·04 per cent. The discharges included one case of general paralysis treated by induced malaria. The general health was good, and there were but few cases of influenza. A permanent occupations officer has been appointed, and it is hoped that this department will develop. Parties were taken to the seaside in the summer and accommodated at a large private hotel. Pathological work is carried out at the Gloucestershire Royal Infirmary. The cinema installation is now in working order and is very popular. An ultra-violet ray installation has been supplied. Twelve patients have full parole beyond the grounds, and 12 more within the grounds. During the year seven nurses passed the final examination of the R.M.P.A., bringing the total certificated to 78 per cent. of the men and 35 per cent. of the women.

ENLARGEMENT OF WELLHOUSE HOSPITAL.—A new block, containing two theatres, has just been added to this poor-law institution at Barnet, which is the largest hospital in Hertfordshire. The cost of erection and equipment was £13,000.

HOSPITAL EXTENSIONS.—The Duke of Connaught recently opened, without ceremony, two new wards at the Children's Hospital, Hampstead.—A fortnight ago Lord Apsley reopened Cirencester Memorial Hospital after its enlargement at a cost of £14,000. The work includes the addition of 14 beds, making a total of 42, with accommodation for another 14 in an emergency, the improvement of the private wards, and additions to the domestic amenities.—About the same time Viscountess Allendale opened the new women's wing of the Wakefield Clayton Hospital. The wing, which contains 48 beds, is the gift of Mr. S. Canning Childs, of New Jersey, U.S.A., who is a native of Wakefield, in memory of his mother. This latest benefaction of Mr. Childs, who was present at the ceremony, brings the value of his gifts to Wakefield to £63,500.

OBITUARY

DONALD MACPHAIL, M.D., F.R.F.P.S. Glasg.

Dr. Donald Macphail, who died on August 2nd, at the age of 77, had been living at Hamilton since he retired from his practice at Coatbridge, Lanarkshire, some seven years ago. He was a graduate of Glasgow University, and on qualification in 1877 took up house appointments at the Western Infirmary under Sir William Gairdner and Sir George Macleod. After a year as resident assistant physician at the Belvidere Fever Hospital he began to practise in Glasgow, and became assistant to Sir George Macleod, then Regius professor of surgery. From early student days he had been an earnest worker, and in association with the late Dr. David Newman and Prof. Joseph Coats he was responsible for starting what afterwards became the clinical and pathological laboratory of the Western Infirmary. Here and elsewhere the scientific trend of his thoughts was clearly evident. When still an undergraduate and president of the University Medico-Chirurgical Society he selected Darwin's "Origin of Species" as the theme of a presidential address at a time when evolution was barely clear on the horizon. In the pathological laboratory he made inquiry into the chemical composition of diseased bone, and devised an ether percolator which economised both time and material. While at Belvidere, he undertook a review of the hospital figures for the eight years preceding 1879, in order to elucidate the seasonal fluctuations of typhus and enteric fever, and the movement in their mortality-rates. To this subject he returned in the *Glasgow Medical Journal* for 1893, in order to demonstrate the possible fallacies of comparing different modes of treating enteric fever without reference to the natural fluctuations in the severity of the disease. To the *Proceedings* of the Pathological and Clinical Society of Glasgow, now merged in the Royal Medico-Chirurgical Society, he was a frequent contributor.

DR. DONALD MACPHAIL.

[*Photograph by Annan.*

Most of Dr. Macphail's life, however, was to be spent in general practice, and within a couple of years he had left Glasgow for Coatbridge, to become surgeon to the employees of two of the large ironworks for which the district is famous. As works' surgeon he began courses of first-aid and ambulance training, which were at that time a novelty, and this was a branch of his activities which he followed for very many years both as a lecturer and examiner. Of his principal occupation it is less easy to write. "To the family doctor, whose energies are wholly absorbed in his work," writes a colleague, "the goal is reached when he wins the friendship and esteem of his patients, and this Dr. Macphail earned and won in full measure. Innate modesty made him indifferent to an evanescent popularity, but the solid esteem in which he was held by his fellows was shown many years ago when, on the opening of the Alexandra Hospital, Coatbridge, he was appointed one of the first operating surgeons. On retirement from practice he was entertained at a public dinner by his fellow-practitioners and other friends, and a few years ago he was elected, without examination, to the Fellowship of the Royal Faculty of Physicians and Surgeons." Outside his work he was a highly accomplished pianist, and took pleasure in sketching.

Dr. Macphail's family, in the present generation, has been closely connected with medicine. A younger brother, Dr. James Macphail, went as medical missionary to the Santals, and his work is now being continued by his nephew. Another brother is Dr. Alexander Macphail, of the Ministry of Health, while yet another, Dr. John Macphail, practised at Barnsley, Yorkshire, until his death a few years ago. One of his daughters, Dr. Katherine Macphail, was the founder, and is now director, of the British Hospital for Children at Belgrade, Yugoslavia.

JOHN ROBERT LORD, C.B.E., M.D., F.R.C.P. Edin.

We regret to announce the death, on Sunday last, after a brief illness, of Lieut.-Colonel J. R. Lord, medical superintendent of Horton Mental Hospital, within a day or two of his 57th birthday. By his death psychiatry loses an ardent and valued worker.

COLONEL LORD.

[*Photograph by Claude Harris.*

John Robert Lord was born at Blackburn in 1874, and educated at the Grammar School there, and later at Owens College. He went on to Edinburgh for his medical studies, during which he organised the University battery of the City Artillery. After qualifying M.B., C.M. in 1896, he became assistant demonstrator in pathology at the School of Medicine. He took his M.D. in 1926 and also the M.R.C.P. Edin., being elected a Fellow of the college in the same year. Under the influence of Clouston he became interested in the study of psychological medicine, and in 1897 held his first appointment as assistant at Carmarthen Mental Hospital to Dr. Edwin Goodall, with whom he kept up a life-long association. In 1898 he entered the mental hospital service of the London County Council, first at Hanwell, and then at Bexley, where he was deputy superintendent. Full charge came to him at the early age of 33, when he was appointed superintendent of Horton Mental Hospital, Epsom. From this time on his whole life and activities centred round the study of mental disorders, with the exception of the years 1915–1919, when he was officer commanding the Horton War Hospital, during which time 45,000 officers and other ranks received treatment. He rose to the rank of Lieut.-Colonel, R.A.M.C., was mentioned in despatches, and received the C.B.E.

Colonel Lord made many contributions to the branch of medicine in which he specialised. His early work was on epilepsy and the study of the pineal gland, along with some anthropometrical research. He was bronze medallist of the Royal Medico-Psychological Association, and his literary contributions dealt with Social Workers and the Insane, the Clinical Study of Mental Disorders, Mental Hospitals and the Public, and the Evolution of the Reception Orders for Mental Patients in England and Wales. At Horton, Colonel Lord was able to put into practice many of his ideas. He was a pioneer in the development of the villa system, and extended it to convalescent villas; he organised a modern type of admission hospital, established one of the first occupation therapy centres, and coöperated with the Ministry of Health in the founding of a malaria therapy centre for the treatment of general paralysis. His work for the Medico-Psychological Association was of outstanding value. From 1900 he was assistant editor of the *Journal of Mental Science*, becoming co-editor in 1911, his keenness contributing largely to bringing that journal to its present high scientific standard. In 1926, after serving for many years on its council, Colonel Lord was elected president of the association, and, as a result of his inaugural address, a research and clinical committee was formed, with himself as chairman. Whilst giving time and energy without stint to work on this and the educational and parliamentary committees, Colonel Lord, during the last ten years, found wider outlet for his activities. He was honorary secretary of the National Council for Mental Hygiene, and latterly a member of the General Nursing Council. In 1930 he went to America to attend the first International Congress for Mental Hygiene. He was elected an honorary member of the Belgian and French psychological societies. In 1928, under the affiliation scheme, he was made lecturer in mental diseases to the London (R.F.H.) School of Medicine for Women.

At Horton, Colonel Lord was regarded as an administrator of outstanding ability; he certainly realised his aim of making the hospital rank among the foremost of mental hospitals. "Those of us who had the privilege of working under him," writes Dr. W. D. Nicol, "found him a good chief and a generous friend. It was in 1920 that it was first discovered that he was a sufferer from diabetes, and his courage in the face of great odds was admirable. He not only overcame his disabilities, but he managed to get the best out of life, and he will be remembered as one who did a great work in the cause of psychiatry. It will be difficult to think of this hospital without him."

Colonel Lord found his relaxation in foreign travel and at home in growing roses. In March of this year he married Miss Ruby Carr, an Edinburgh medical graduate on the Horton Hospital staff, with whom he shared his many interests.

MEDICAL NEWS

Royal Colleges of Physicians of London and Surgeons of England.

At the Final Examination of the Conjoint Board, held from July 6th to 28th, the following candidates were approved in the subjects indicated, but are not eligible for the diplomas of the colleges:—

Pathology.—H. Ackers, Liverpool; H. Agar, Leeds; C. F. S. Aiken, Middlesex; G. T. Allen, St. Thomas's; G. N. Barker, St. Thomas's; Mavis W. M. Beddall, Univ. College; H. Blumovitch, St. Bart.'s; G. H. Brookman, St. Bart.'s; D. G. W. Brown, Liverpool; W. Bullock, Liverpool; V. Constad, Guy's; H. V. Corbett, Liverpool; T. A. L. Davies, St. Thomas's; A. H. Dunkerley, Camb. and Manchester; G. E. Dunkerley, Univ. College; F. R. Edwards, Liverpool; G. M. Evans, Bristol; T. A. Gavin, Guy's; K. J. Gilchrist, Guy's; A. M. Gill, Middlesex; J. H. L. Gilmore, M.A. Camb. and St. Thomas's; M. Hafezi G. P. Gladstone, London; F. J. S. Gowar, Middlesex; M. Hafezi St. Mary's; R. J. C. Hamilton, St. George's; H. G. Hanley, Liverpool; Helen A. Hatrick, Univ. College; W. N. Hine, Middlesex; L. A. Hiscock, St. Bart.'s; R. A. P. Hogbin, Guy's; A. Hollingsworth, St. Thomas's; M. S. Holzman, London; W. A. John- A. C. Howard, Univ. College; D. H. Irish, Guy's; W. A. John-son, St. Mary's; T. B. Jones, Westminster; W. H. Jones, Manchester; W. W. Jones, Guy's; E. Kaminsky, Univ. College; K. D. Keele, St. Bart.'s; J. J. Kempton, Bristol; A. Kennedy, St. Thomas's; L. O'N. Knox, Guy's; W. Kravchick, St. Bart.'s; L. W. Lauste, St. Thomas's; I. Levy, Guy's; J. R. M. Martin, St. Bart.'s; J. A. W. Miller, Guy's; M. A. N. Moezuddin, St. Thomas's; J. de C. Muller, St. Thomas's; Irene P. Murray, King's Coll.; P. H. Nankivell, Middlesex; W. T. North, Guy's; R. S. Ogborn, Univ. College; G. B. Palmer, L.D.S., Guy's; J. S. Parkinson, Manchester; R. H. Patel, Birmingham; S. Paul, Guy's; Norah W. K. Petter, Royal Free; W. S. Pitt-Payne, Guy's; C. B. R. Pollock, Guy's; V. T. Powell, Cardiff and Guy's; F. Radcliffe, Camb. and St. Bart.'s; J. C. Read, L.D.S., Guy's; R. G. Reid, Guy's; D. F. Robb, St. Thomas's; P. G. Roberts, St. Bart.'s; R. D. Roper, Camb. and St. Bart.'s; A. Rothwell, Camb. and King's Coll.; H. W. Salmon, Middlesex; O. A. Savage, St. Bart.'s; G. O. Sawyer, Guy's; R. T. Shipman, St. Thomas's; P. Q. M. Spaight, St. Bart.'s; K. W. Stroude, Liverpool; D. J. Swamy, Durham; S. K. K. Sze, Camb. and St. Thomas's; J. R. Thornton, St. Thomas's; E. Troensegaard-Hansen, Charing Cross; A. A. M. Wajih, Charing Cross; A. R. Walters, Middlesex; Clara M. Warren, Royal Free; H. Waterman, Leeds; S. W. Wright, Guy's.

Medicine.—S. S. Alam, M.B. Punjab; A. B. Anderson, Ph.D. Camb., Univ. College; A. Ascher, King's Coll.; T. J. Ashley, Cardiff; G. Ashton, Oxford and Univ. College; M. Bloom, Manchester; H. Blumovitch, St. Bart.'s; L. Bowen, St. Bart.'s; J. R. Braybrooks, Oxford and King's Coll.; I. Cohen, King's Coll.; H. W. Cowen, Camb. and Univ. College; R. A. F. Creet, St. Thomas's; A. S. V. Daniels, L.D.S., Westminster; S. C. De, M.B. Calcutta; Jennie G. Evans, Westminster; F. R. Glover, London; R. A. E. Hammond, Camb. and Guy's; Joan G. Harcourt, Royal Free; Florence D. Hawes, Royal Free; Doris I. Howell, Charing Cross; E. Kaminsky, Univ. College; B. L. Kapur, M.B. Punjab, Univ. College; K. D. Keele, St. Bart.'s; Victoria H. King, Royal Free; H. H. Langston, St. Bart.'s; O. C. Levine, Univ. College; J. MacDonald, M.B. Glasg.; J. A. S. Marr, M.B. Cape, Middlesex; J. R. M. Martin, St. Bart.'s; Oonah L. Matthews, Univ. College; M. T. Maung, M.B. Rangoon, Guy's; I. D. Monger, Wales and Charing Cross; Elisabeth J. Morris, Liverpool; D. R. Narang, M.B. Punjab, London; H. D. Owen, Liverpool; E. Palmer, Camb. and King's College; T. J. Phillips, Univ. College; Pushpawati, Punjab and Royal Free; G. Ramage, M. B. Manchester; B. Roberts, Univ. College; J. Rosenberg, Guy's; M. G. Ross, Leeds; C. R. Sadler, Camb. and St. Thomas's; I. N. Samuel, Middlesex; Marie W. E. Schuyt van Castricum, Royal Free; C. K. Shain, Leeds; J. W. V. Sheldon, Guy's; H. M. Singer, King's Coll.; D. Stone, Cardiff and Guy's; I. Sutton, M.B. Manch.; W. S. Tegner, Oxford and London; C. H. T. Wade, M.B. Manch.; A. A. M. Wajih, Bengal and Charing Cross; W. W. Walther, Univ. College; H. C. M. Walton, Camb. and St. Mary's; R. A. Wesson, Univ. College; L. E. Williams, Univ. College; D. S. P. Wilson, Dublin; H. T. S. Wise, King's College.

Surgery.—G. T. Allen, St. Thomas's; E. T. Bannister, Univ. College; F. J. Beilby, St. Bart.'s; E. A. R. Berkley, Guy's; J. B. Bishop, Oxford and St. Thomas's; H. W. Boake, Camb. and St. Thomas's; H. E. Bonnell, King's Coll.; C. P. F. Boulden, Camb. and London; F. J. Burke, Liverpool; T. A. R. Callender, London; M. Chalkowski, St. George's; T. Chandrasekharan, L.M.S.S.A. Madras; N. E. D. de Silva, Univ. College; C. D. Evans, Camb. and St. Mary's; M. Farooq, St. Bart.'s; J. W. H. Foy, Liverpool; H. T. Giblin, Calcutta and St. Mary's; A. C. Gladstone, St. Thomas's; L. E. Green, St. Bart.'s; R. A. E. Hammond, Camb. and Guy's; Elizabeth M. Handfield-Jones, Oxford; Joan G. Harcourt, Royal Free; Margaret Hardwick, Leeds; W. P. Hedgcock, St. Thomas's; L. A. Hiscock, St. Bart.'s; A. C. Howard, Univ. College; J. Howell, Camb. and Guy's; S. V. Humphries, Camb. and St. Thomas's; W. Hunt, Camb. and St. Bart.'s; Daisy G. Iliff, King's Coll.; J. M. Jackson, St. Bart.'s; N. D. Jekyll, Camb. and London; D. E. V. Jones, King's Coll.; R. A. Jones, Camb. and London; E. Kaminsky, Univ. College; Florence E. Kingsley, Westminster; E. A. Knappett, Univ. College; Annie Lawson, Leeds; F. Livesey, M.B. Manchester; J. M. Low, St. Mary's; J. G.

McGrath, Manchester; J. G. Madden, Middlesex; W. A. Mayne, Camb. and St. Thomas's; C. F. Mayo-Smith, St. George's; T. F. Miles, St. Thomas's; P. H. Nankivell, Middlesex; N. C. O'Byrne, St. Thomas's; R. S. Ogborn, Univ. College; M. W. C. Oldfield, Oxford and Leeds; W. H. Owles, Oxford and Guy's; A. Papert, St. Bart.'s; R. C. T. Pearson, Camb. and St. Thomas's; G. R. C. Rayner, Camb. and Guy's; G. O. S. Reid, St. Mary's; I. C. Robertson, Camb. and St. Thomas's; I. Sutton, M.B. Manchester; J. C. S. Thomas, St. Bart.'s; Clara M. Warren, Royal Free; H. A. T. Wells, Madras and Guy's; Shirley E. Whitaker, Univ. College; F. C. H. White, Camb. and St. Bart.'s; D. S. P. Wilson, Dublin; J. M. Wingfield, Birmingham and St. Mary's; C. E. R. Wood, Camb. and Guy's; F. H. Wood, Birmingham.

Midwifery.—E. L. Allen, St. Bart.'s; A. B. Anderson, Ph.D. Camb., Univ. College; R. Baker, Leeds; E. T. Bannister, Univ. College; F. H. E. Beckett, Guy's; H. L. Beckitt, London; J. G. Billington, Camb. and St. Thomas's; C. P. F. Boulden, Camb. and London; L. Bowen, St. Bart.'s; G. H. Brookman, St. Bart.'s; F. E. Buckland, Oxford and St. Georges; J. D. Burrows, St. Thomas's; J. W. Campbell, Camb. and St. Bart.'s; N. G. Chitnis, Bombay and Dublin; J. G. R. Clarke, St. Thomas's; T. A. Connold, St. Thomas's; P. T. Cooper, Camb. and St. George's; F. N. Corfe, L.D.S., Guy's; D. R. Crabb, St. Bart.'s; G. W. Crimmin, Camb. and St. Thomas's; Elizabeth Curphey, Westminster; A. R. Cutlack, St. Bart.'s; A. S. V. Daniels, L.D.S., Westminster; A. L. Davies, Middlesex; A. M. Davies, Bristol; R. P. Davies, L.M.S.S.A., Cardiff and London; W. H. D. Davies, St. Bart.'s; D. C. De Wet, St. Thomas's; A. H. Dunkerley, Camb. and Manchester; Q. F. Evans, St. Thomas's; K. Fawssett, St. Thomas's; L. P. Fitch, St. Thomas's; G. H. Gibbens, St. Thomas's; T. Gibson, St. Thomas's; A. M. Gill, Middlesex; G. P. Gladstone, London; F. J. S. Gowar, Middlesex; R. D. Green, London; C. S. Hall-Smith, Camb. and St. Bart.'s; C. F. Hamilton-Turner, Oxford and St. George's; Margaret Hardwick, Leeds; P. L. S. Hatton, St. Bart.'s; R. F. Hawke, London; S. T. Hayward, St. Bart.'s; K. H. C. Hester, London; A. Hollinrake, St. Bart.'s; J. M. Holmes, Leeds; M. S. Holzman, London; W. B. Howell, St. Mary's; A. G. James, Leeds; R. James, St. Mary's; W. L. James, Guy's; D. J. Johnson, Camb. and St. Bart.'s; E. T. Jones, Cardiff and London; R. A. Jones, Camb. and London; B. L. Kapur, M.B. Punjab, Univ. College; Agnes V. Kelynack, Royal Free; J. J. Kempton, Bristol; A. Kennedy, St. Thomas's; W. Kravchick, St. Bart.'s; L. W. Lauste, St. Thomas's; O. C. Levine, Univ. College; J. T. R. Lewis, Middlesex; W. H. Lewis, Camb. and Guy's; M. B. Lindsay, St. Thomas's; F. Livesey, M.B., Manchester, S. Livni, London; Monica Low, Royal Free; Ethelberta M. Lynton-Low, Royal Free; D. C. McClure, London; I. A. MacDougall, Guy's; N. F. Maclagan, Middlesex; J. A. S. Marr, M.B. Cape, Middlesex; P. G. C. Martin, Camb. and Manchester; J. N. Matthews, Liverpool; F. S. A. Maw, Camb. and King's Coll.; G. J. Meikle, Camb. and Middlesex; R. V. F. Mercer, Camb. and St. Bart.'s; W. H. W. Morris, St. Thomas's; Edith A. Muirhead, Royal Free; J. de C. Muller, St. Thomas's; C. G. Nicol, L.M.S.S.A., St. Mary's; R. C. T. Pearson, Camb. and St. Thomas's; J. C. Pedley, Middlesex; M. C. Perkowski, Middlesex; F. W. J. Platts, Camb. and King's Coll.; C. R. D. Porter, Middlesex; T. W. H. Porter, Oxford and Middlesex; V. T. Powell, Cardiff and Guy's; K. C. Priddy, London; F. Radcliffe, Camb. and St. Bart.'s; G. Ramage, M.B. Manchester; H. M. Rashid, Birmingham; E. R. B. Reynolds, St. Thomas's; M. G. Ross, Leeds; H. W. Salmon, Middlesex; H. B. C. Sandiford, St. Thomas's; M. H. P. Sayers, St. Thomas's; S. B. H. Saunders, Camb. and St. Bart.'s; M. Shankhla, Leeds; J. R. S. Sharp, Guy's; R. T. Shipman, St. Thomas's; K. Singh, St. Thomas's; E. R. Sinton, Birmingham; W. P. Stamm, Guy's; Joan W. Stelfox, Liverpool; S. K. K. Szo, Camb. and St. Thomas's; G. H. Taylor, Guy's; Enid A. Taylour, Bristol; G. L. Timms, St. Thomas's; J. B. L. Tombleson, St. Thomas's; O. S. Tubbs, Camb. and St. Bart.'s; Patricia I. Unsworth, Liverpool; C. H. T. Wade, M.B. Manch.; H. C. Wadge, Oxford and St. George's; C. J. Watson, Camb. and St. George's; R. A. Wesson, Univ. College; E. W. Wilkins, Birmingham; E. J. Williams, Oxford and London; W. Wilson, Camb. and St. Bart.'s; H. W. Wykes, Middlesex.

Royal College of Physicians of London.

The College will be closed from August 17th till Sept. 19th, both days inclusive.

British College of Obstetricians and Gynæcologists.

The quarterly meeting of the Council was held in London on July 27th, with Prof. W. Blair Bell, the President, in the chair. Prof. J. M. Munro Kerr (Glasgow) and Dr. J. S. Fairbairn (London) were re-elected vice-presidents for the current year. A vacancy for a representative of the Members on the Council, occasioned by the elevation to the Fellowship of Prof. E. Farquhar Murray, was filled by the election of Mr. J. St. George Wilson (Liverpool) for the remainder of the current year.

Dr. T. M. Healy (Dublin) and Dr. Margaret I. Balfour (India) were admitted to the Fellowship *in absentia*.

It was reported that the finance and executive committee had inspected several premises but had so far not found a house in London that conformed to the requirements of the College. It was decided that the annual dinner should be held at Grosvenor House, Park Lane, London, on Oct. 23rd, and that this should be preceded by a ceremony for the conferment of the honorary Fellowship on Lord Riddell, Prof. Paul Bar (Paris), Prof. Whitridge Williams (Baltimore, U.S.A.), and Prof. Essen-Möller (Lund, Sweden), and also of ordinary Fellowships and Memberships.

A Hospital Rate.

The town council of Gillingham, Kent, has decided to levy a rate towards the support of two of the local hospitals. The rate is expected to produce £585, of which £300 is to be allocated to St. Bartholomew's Hospital, Rochester, and £105 to the Kent County Ophthalmic and Aural Hospital at Maidstone.

Medical Diary

Information to be included in this column should reach us in proper form on Tuesday, and cannot appear if it reaches us later than the first post on Wednesday morning.

LECTURES, ADDRESSES, DEMONSTRATIONS, &c.

FELLOWSHIP OF MEDICINE AND POST-GRADUATE ASSOCIATION, 1, Wimpole-street, W.

Monday, August 17th, to Saturday, August 22nd.—All Saints' Hospital, Vauxhall Bridge-road, S.W. Special post-graduate course in Urology. Afternoons and some evenings. Demonstrations and cystoscopies.—Queen's Hospital for Children, Hackney-road, E. All day course. Medical and surgical demonstrations. Two weeks.—Further particulars from the Fellowship of Medicine.

ST. MARK'S HOSPITAL, *City-road*, E.C.

Thursday, August 20th.—4.30 P.M., Mr. E. T. C. Milligan: Modern Surgery of the Colon.

Appointments

Ackerman, W. L., M.D., M.R.C.P. Lond., has been appointed Resident Medical Officer of Brighton Infirmary and Warren Farms Schools.

Drum, E. F., M.B., Ch.B. N.U.I., Asst. Superintendent, Peamount Sanatorium, Dublin.

Gebbie, N., M.D., Ch.B. Glas., D.P.H., M.O.H., Hull.

Main, F. F., M.B., Ch.B. Edin., Asst. M.O.H., Burgh of Kilmarnock.

London County Council: Rose, D. F. (Miss), M.A., M.B., Ch.B. Edin., D.P.H., Temp. Asst. M.O., Hackney Hospital; Lindford, H. (Miss), M.D., Ch.B., Temp. Asst. M.O., Mile End Hospital; Morgan, J. (Miss), M.B., B.S. Lond., Temp. Asst. M.O., St. Andrew's Hospital; Sandow, J. F., L.R.C.P. Lond., M.R.C.S., Temp. Asst. M.O., St. James's Hospital; Chamings, R. W. E., M.B., B.S., Temp. Asst. M.O., St. Giles's Hospital; Hicks, J. A. B., M.D., M.R.C.P. Lond., M.R.C.S., Pathologist, Lambeth Hospital Group Laboratory; Barnard, W. G., M.R.C.P. Lond., M.R.C.S., Histologist, Southern Group Laboratory; Allott, G. N., M.R.C.P., Pathologist, Lewisham Hospital Group Laboratory; Goodhart, G. W., M.D., B.Ch. Camb., Pathologist, Archway Hospital Group Laboratory; and Evans, Sir Thomas G. Carey, M.D. Brux., F.R.C.S. Eng., L.R.C.P. Lond., Medical Superintendent, Hammersmith Hospital.

Births, Marriages, and Deaths

BIRTHS.

Jack.—On August 3rd, at Tunbridge Wells, the wife of Lt.-Col. Jack, I.M.S., of a daughter.

Simmons.—On July 31st, 1931, to John and Margery Simmons, M.B., B.S., B.Sc. (née Freeborough), of New Chilterns, Amersham Common, Bucks.—a daughter.

Stott.—On August 3rd, the wife of Dr. W. B. Stott, of Parkleigh, Park Drive, Grimsby, of a daughter.

MARRIAGES.

Highmoor—Cairns.—On August 5th, at St. Mary's Church, Ellon, Richard Anthony Highmoor, F.R.C.S.E., Bramerton, Norwich, to Margaret Combat, youngest daughter of Provost and Mrs. Cairns, Hassendean, Ellon, Aberdeenshire.

MacCormac—Broomhall.—On August 5th, at the Parish Church of Bishops Lavington, Henry MacCormac, M.D., F.R.C.P., to Marion Maud, eldest daughter of Dr. and Mrs. Broomhall, of Tai Yuan Fu, China.

DEATHS.

Andrews.—On August 6th, at Beckmeadow, Mundesley, Norfolk, Lieut.-Col. L. A. A. Andrews (Dombey), late R.A.M.C.

Connolly.—On August 5th, at Kingsdown, Ireland, Colonel E. P. Connolly, late R.A.M.S., aged 54 years.

Lord.—On August 9th, at Horton House, Epsom, Lieut.-Colonel John Robert Lord, C.B.E., M.D., F.R.C.P.E., Medical Superintendent, Horton Mental Hospital (L.C.C.).

N.B.—A fee of 7s. 6d. is charged for the insertion of Notices of Births, Marriages and Deaths.

NOTES, COMMENTS, AND ABSTRACTS

OSTEO-ARTHRITIS.*

BY PHILIP FIGDOR, M.B. GLASG.,
PHYSICIAN TO ST. JOHN'S HOSPITAL, LEWISHAM; ASSISTANT PHYSICIAN TO THE LONDON TEMPERANCE HOSPITAL.

A GOOD deal of confusion still surrounds the subject of osteo-arthritis. This is partly because most of the work that has been done has been directed towards finding a specific remedy, while the disease itself has not yet been adequately studied and described. Different writers attach different meanings to the term osteo-arthritis, and the result is extremely confusing to anyone who consults their text-books.

In 1913 Sir Thomas Horder [1] suggested the classification of chronic arthritis into two main groups:—

1. *Osteo-arthritis*, mostly single joint affections affecting elderly people, with early bony changes.
2. *Rheumatoid arthritis*, mostly a polyarticular disease affecting younger people and with inconspicuous bony changes.

I find myself in agreement in principle with this classification, except that I would divide my two groups into (1) osteo-arthritis or mono-arthritis, and (2) polyarthritis.

The term polyarthritis is becoming increasingly popular with European writers. There are several distinct forms of polyarthritis, and some of them are definitely not what is understood by rheumatoid arthritis. In fact, rheumatoid arthritis is a term which is not used so much as formerly, and should be discarded.

Radiological Appearances.

Our present state of knowledge of osteo-arthritis owes a great deal to radiology, which enables us to differentiate it from other forms of chronic arthritis. A clinical diagnosis of osteo-arthritis can always be either confirmed or excluded by X rays.

I regard Thomson's [2] description of the X ray appearances as a standard. He states that cyst-like structures are seen in all radiograms of osteo-arthritis, and tend to be massed together in localised areas of bone, forming what he calls "storm centres of disease." He claims that acute clinical symptoms (presumably pain) can always be shown to be associated with activity of one or more cyst-like formations on the joint surface. He goes further and states that, in joints without acute clinical symptoms, active cyst-like foci are not seen on the joint surfaces.

Clinical experience shows that there is some basis for this statement. Every now and again one comes across a case where it is accidentally discovered that the patient has definite, even advanced, osteo-arthritis and denies that he ever felt a twinge of pain or stiffness.

A brawny navvy of 50 injured his left knee while digging in the street. On the following day he had an acute synovitis and was sent to hospital for X ray examination to discover if there was any fracture. There was no fracture, but the radiologist reported an advanced degree of osteo-arthritis of the knee-joint. When I saw him, a few days later, I put it to him that he must have had pain in the joint before his accident. This he strenuously denied, pointing out that he had been a labourer, chiefly on road work, all his life. He had pain and limitation of movement of the knee-joint, of course, while he had synovitis, but after a few weeks his synovitis cleared up. Although he had coarse grating in the joint, he had full and free active movement of the joint and said he had no pain. He then returned to his work and, although he promised to return to see me if he had any pain or stiffness in the knee, he has not done so. Presumably he has remained well, although it is now four years since he attended hospital.

A somewhat similar case is that of a man, aged 62, a ship's rigger, who wrenched his left elbow while at work. A radiogram taken on the following day showed advanced osteo-arthritis of the elbow-joint. Here again the man denied previous pain or incapacity, pointing to the fact that his elbow had to function perfectly as he has to do a lot of climbing at his work.

Thomson [2] visualises two distinct and separate radiographic stages: (1) A primary stage, either cystic or granulomatous in type. This leads to erosion of joint cartilage. (2) A secondary stage of villous and osteophytic changes, which may result from such a mechanical erosion. He emphasises the fact that he considers the cyst-like formation to be the important radiographic sign, and almost pathognomonic. The osteophytic out-growths he believes not to be an essential part of the disease, but a product of the patient's reaction, an effort of nature to give extra support to or to limit the functions of diseased joints. It is not, radiographically, diagnostic of the disease.

R. L. J. Llewellyn [3] also recognises two stages in the life-history of osteo-arthritis—namely, a primary or pre-osteophytic phase of prolonged duration, the symptoms being those of villous hypertrophy, and a secondary or terminal stage in which bony and cartilaginous outgrowths appear. His view is that osteo-arthritis is a generalised and not a localised disorder. He thinks that it can be prevented from developing in the early stages, and says that osteophytes are shown in one knee and not in its fellow.

This is a point to which I would draw attention. I quite agree that one frequently comes across cases where the X rays show osteophytes in one knee only in the early stages. But my interpretation of this differs from Llewellyn's in that I hold that the appearance or development of osteo-arthritis in the second knee is a traumatic result of increased strain thrown on that knee when the other is more or less out of action.

Ætiology.

Consideration of this subject almost always begins with the words "septic focus," and attempts to find an organism and to supply a vaccine. In the last two decades research has generally been in that direction. As it is only in the last few years that the radiologists have enabled us to label the disease with accuracy, it seems to me that there is still a great deal to be done in the way of bed-side investigation, as distinct from the laboratory. I have investigated 480 cases of osteo-arthritis, all of which have been confirmed by radiographic diagnosis. The accompanying table shows that osteo-arthritis is a disease of middle and advancing age and that females are more affected than males; this is partly, but not wholly, explained by the fact that females live longer. It will be noted from the table that I have not come across a case of osteo-arthritis in a man below the age of 30, while I have had ten cases in women between 20 and 30, some of them in the early 'twenties.

Cases of Osteo-arthritis.

Age.	Male.	Female.	Total.
20–29	—	10	10
30–39	10	37	47
40–49	58	75	133
50–59	58	56	114
60–69	72	70	142
70–79	18	14	32
80 and over	2	—	2
	218	262	480

I believe that osteo-arthritis is traumatic in origin, or rather, that the exciting cause is a trauma. In my cases 207 out of 480 gave a definite history of an injury, sometimes several years before the onset of osteo-arthritis. But, in stating that osteo-arthritis is traumatic in origin, I bring in stress and strain as evidence of trauma, as well as injury. Many cases with no direct history of injury or accident come into this category.

A man of 58 came to hospital with pain in the left shoulder, going down to the fingers, of three months' duration. X ray showed a moderate degree of osteo-arthritis of the shoulder-joint. He had never had an injury, but on inquiry I found that he had been an engineer but, owing to inability to get work at his trade, he had for the last three years been a telephone labourer, which meant carrying a 30-lb. bag of tools on his left shoulder.

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* Abridged from a lecture to the Fellowship of Medicine.

A man, over military age, drove a general in France during the war for eleven months. The car was a powerful one and had a very stiff clutch. He said that he used to have pain in his back at the end of a day's driving. When he gave up driving the car the pain left him. However, several years later when I saw him, he had severe pain in his back and an X ray showed advanced osteo-arthritis of his left sacro-iliac joint.

A man who had been an all-round athlete took up fencing when he reached the middle 'forties. He entered into it with such zest that he became a champion. I saw him when he was 62, and he had not been able to fence for some years because he had osteo-arthritis in both hip-joints, more on the right than on the left. The pathological factor in this case is that a strain was put on joints in middle age to which they were not accustomed. It is fairly safe to say that, had he been a fencer from his youth upwards, he would not have developed osteo-arthritis of his hip-joints.

Osteo-arthritis usually attacks only one joint (excluding the vertebræ). If two or more are affected, close investigation will establish that symptoms began in one an appreciable time before the second, and X rays will confirm this. The cause of the second joint being involved is traumatic—e.g., an osteo-arthritis in one hip-joint will cause the patient to put an increased load or strain on the other hip-joint and will, in untreated cases, cause osteo-arthritis there.

In my series there are 12 cases where both hip- and knee-joints were affected; in six the hip-joint was affected first and in the other six the knee-joint. It is noteworthy that osteo-arthritis occurs in the women who have a rapid and heavy increase in body-weight before or at the time of the menopause. In my series of 100 cases of osteo-arthritis of the knee-joints in women only 28 gave a history of injury.

The type of direct injury that causes osteo-arthritis is more obvious. A young man dislocates his shoulder. The dislocation is reduced and he has no further trouble. A middle-aged or elderly man has his dislocation reduced and in a variable number of months or a year or two he develops an osteo-arthritis of the shoulder-joint. A similar result frequently follows a fracture of the upper end of the humerus. A workman has a fall, or is struck on the back. He is taken to hospital and is X rayed, with negative results as regards fracture. In many of these cases osteo-arthritis of the spine develops later.

It is trauma in the middle-aged and elderly that produces osteo-arthritis. Similar traumata in the young do not.

In my series of lumbar and sacro-iliac osteo-arthritis in women, 36 out of 46 had no history of injury, but 26 had had gynæcological operations and two had had hæmorrhoid operations. Eight of these 28 had had pain in the back before the operation, but the others had not, and in all the other 20 pain in the back came on within a few months of operation, and the X ray showed sacro-iliac osteo-arthritis. I incline to the view that this was due to injury to the sacro-iliac joints at the time of operation, in placing the patient into position for operation, or in letting the legs down afterwards.

“ Malignant Arthritis.”

Osteo-arthritis, like cancer, attacks the middle-aged and elderly—i.e., the physiologically dying. Trauma in this state produces a pathological change. What is this change? Thomson and other radiologists are emphatic that the process is degenerative and not malignant. But though the radiologists may be emphatic, their task is not always easy.

A few months ago I saw a woman, aged 51, who was clinically a well-established case of osteo-arthritis of the right shoulder-joint. I sent her for a X ray examination to confirm the diagnosis. The radiologist's report was as follows: “ The bone of the upper third of shaft and head of the humerus and of scapula in region of shoulder-joint shows areas of rarefaction. ? Cystic degeneration. Is there any question of secondary deposits in this case? ”

In this case there was no question of any pre-existing malignant disease and yet that was the radiologist's report. Every now and again one gets these reports, particularly from young and inexperienced radiologists.

That the disease does not kill is no criterion. It causes such severe pain and is often so resistant to any treatment that one is almost justified in labelling it “ malignant arthritis.”

To those who still think in terms of oral sepsis, it can be pointed out that the disease attacks people who have reached the age of double dentures, and, in those who have teeth, extraction of the remaining teeth seems to make very little difference. As a matter of fact, osteo-arthritis seems to attack mainly people who have led healthy, active, temperate, and even abstemious lives. The intemperate form a very small proportion of these cases. These people deserve a good deal more sympathy than they receive. The pain of osteo-arthritis is one of the most severe that any disease produces, yet the victims, because, as they say, “ they have nothing to show for it,” are enjoined by their friends (and often by their doctors) to exercise the joints or they will get stiff and have more pain. Of course, the more they exercise the worse the pain.

Diagnosis of Osteo-arthritis.

It is, of course, very important to diagnose the condition as early as possible, for the prognosis depends very largely on that. Now, particularly in the case of the shoulder- and hip-joints, the first symptom is generally a pain, not located at or near the joint itself but in the muscles below the joint—i.e., a referred pain. A good proportion of these cases come to the hospital with a diagnosis of “ neuritis.”

In my series 128 out of 145 cases of osteo-arthritis in the shoulder-joint had referred pain down the arm, mostly pain from the shoulder to the elbow; and in the hip-joint 54 out of 64 had pain down the thigh, sometimes to the knee, and a few had pain in the knee-joint only. This referred pain is not only an early symptom, but it is the main symptom throughout the history of the case until, in fact, the disease is arrested. In the knee-joint pain is generally confined to the knee. Only a small minority complain of pain radiating down the shins. In sacro-iliac and lumbar osteo-arthritis, the pain is generally confined to the lower back, but some cases reach hospital diagnosed as sciatica.

Limitation of movement of the joint is usually early. In the hip-joint and shoulder-joint abduction is the chief restriction. As the disease progresses, there is a functional ankylosis. I have come across an occasional bony ankylosis in the hip-joint, but most authorities deny that this ever happens.

Grating occurs in the knee-joints, but is not diagnostic, because it also occurs commonly in healthy joints. The same remark can apply to the early stages in the shoulder-joint. The knee-joint, however, does become definitely enlarged, particularly—judging by its appearance—the lower end of the femur, giving the knee a characteristic look.

The gait of a person with osteo-arthritis of the hip-joint is a characteristic waddling, with almost nothing to distinguish it from that of a case of congenital double dislocation of the hip-joint. Muscular wasting occurs, but it is seldom a gross wasting and sometimes is not very apparent.

A PATHOGNOMONIC SIGN.

In observations previously published,[4] I have noted what I believe to be a pathognomonic sign of osteo-arthritis in the lumbo-sacral region, including, of course, the sacro-iliac joints. When the patient lies on his face and the lumbo-sacrum is palpated with the flat of the fingers, there is a characteristic flabby, “ penetrating ” feel of the wasted lumbar and sacral muscles, giving one almost the impression that one is palpating the bare bone. There is no tenderness on palpation. It is difficult to describe the tactile sensation one receives, but I believe it to be pathognomonic. Of the 86 cases in my series every one had this sign.

Treatment.

I have elsewhere [5] defined a specific therapeutic agent as “ one which, used in a particular, definite, and specified form—e.g., in a drug of a definite chemical composition—and applied in a particular, definite, and specified way to a particular, definite, and specified disease or pathological condition, secures a relief from symptoms and a return to normal and active function of the body or part, excluding permanent tissue damage." According to that definition, there is no specific remedy for osteo-arthritis.

Claims have been made that particular micro-organisms are the cause of osteo-arthritis, but Koch's postulates have not been fulfilled.

Warren Crowe[6] believes in the view, advanced by many workers in the last two decades or so, that streptococci are the cause of osteo-arthritis and non-articular rheumatism. He stresses the numerous varieties of streptococci and the difficulty in differentiating them. In treatment, therefore, in order to make certain that the several streptococci infecting any given patient are included, he advocates the use of a stock streptococcus vaccine, containing the greatest possible number of different streptococci.

My own view, and one that I take care to emphasise to patients, is that the most important part of treatment is rest. The affected joint must be rested. Future restoration of function of the joint is, in my belief, a secondary consideration to getting rid of the pain. The first object of treatment must be to ease the patient of the sometimes intolerable pain he suffers. I am against any forcible movement of the joint, as it sometimes lights up the disease again. Some cases where the pain has entirely ceased but where there is almost an ankylosis of the joint, in the course of a year or two (sometimes a few months), with freedom from pain, achieve an almost complete restoration of function of the joint by the patient's own natural efforts.

In osteo-arthritis of the shoulder-joint, the arm should be placed in a complete sling, with the elbow well supported, so that all weight is taken off the shoulder-joint. It is surprising what relief this simple procedure often gives. It is not easy to achieve rest of the hip- or knee-joints while the patient is going about. In some cases a walking calliper is the only thing that will ease the pain.

I believe that osteo-arthritis is a local and not a general condition, and that local treatment in the form of rest is essential. The application of liniments and pastes to the seat of pain or to the joint is useless. Massage, also, is not only useless but is contra-indicated, as it often increases the pain.

Diathermy is the most valuable form of treatment. The current should be directed to and concentrated on the affected joint and nowhere else, and should be given three times a week for 15 to 20 minutes. Where the patient reacts to this treatment, sometimes as few as half a dozen treatments will give relief from pain of some months' duration, but generally the duration of treatment should be reckoned as many weeks up to several months. I believe that diathermy is the nearest approach we have to a specific remedy for osteo-arthritis. The patient generally finds the treatment very soothing, and it frequently banishes the pain for the time being, even in the early days. Precisely how it acts one cannot determine. Certainly in the majority of cases it seems to arrest the disease process, whatever that may be. The large majority of my cases have done very well with diathermy and require no other form of local treatment.

Every now and again one comes across cases that do not respond to diathermy, but do well with radiant heat or chlorine ionisation, provided that the patient has had a course of diathermy first.

There is one form of general treatment which must be given in all cases, and that is an analgesic or a sedative of some kind until the local treatment has had time to take effect. I generally advise grs. 10 or grs. 15 bromide mixture thrice daily. If the pain disturbs the patient's rest I *do not* hesitate to give a soporific nightly for several weeks if necessary. The most important point of all is the necessity for as complete rest to the joint as it is possible to obtain.

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THE TREATMENT OF FRACTURES.

A CONCISE and valuable account of the treatment of fractures and its underlying principles has been prepared by the Fracture Committee of the American College of Surgeons[1] and published in the quarterly *Bulletin* of the College (1931, xv., No. 1). In 30 pages, *copiously illustrated*, a description is given of the normal processes of bone repair, the conditions favouring them, the functions of practitioner and surgeon in promoting them, and the management of many particular varieties of fracture. No attempt has been made to describe operative procedure, the technique of skeletal traction, or methods of local anæsthesia, and the summary is written with an eye to the requirements of general rather than hospital practice. Emphasis is laid especially on the importance of the "emergency initial treatment," the dangers of delay, and the importance of functional restoration. "The treatment of difficult fractures requires the care of experienced surgeons."

The outline concludes with the following series of aphorisms:—

APHORISMS.

Always use gentleness and care in handling any broken limb. Roughness is inexcusable.

Use only the simplest methods of examination for the diagnosis of fracture.

Eliminate all unnecessary handling of the injured limb.

Definite localised tenderness over an injured bone usually is satisfactory evidence of fracture.

Never attempt to elicit crepitus.

Disturb the patient and the injured part as little as possible.

Do not be deceived by the absence of deformity and disability; in many cases of fracture some ability to use the limb persists. Sufficient examination is one which includes a short history, a brief inspection and palpation limited to the localisation of the point of greatest tenderness, coupled with a slight test for false motion.

Do not overlook the responsibility of making a diagnosis. Look for more than one fracture.

An exact diagnosis is absolutely essential to proper treatment and requires suitable X ray films taken in two planes.

Make it a duty to see that the patient has an early suitable X ray examination and competent treatment *thereafter*.

Keep the axes of the ankle- and knee-joints absolutely transverse. When the sole of the foot rests flat on the ground, the top surface of the astragalus should be parallel with the ground.

A stiff shoulder following a fracture of the forearm usually may be prevented. The functional utility of the limb as a whole is a good measure of successful treatment.

Following fracture, the damage of the injury per se must always be reckoned with and deducted from the normal attainable by treatment.

Passive movements affect bone and joint surfaces, often injuring them both. Active movements affect muscles and mind, usually strengthening both. Guided muscular contractions are of primary importance in causing bony union provided, of course, motion of the bone fragments is avoided. Doctors and the public have been taught for ages to keep broken limbs at absolute rest for many weeks.

Apply traction in such a way as to tire the muscles and not produce irritation; that is, make the pull slow, steady, and if necessary increase its force, until the contraction of the muscles attached to the fragments is overcome.

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[1] 40, East Erie-street, Chicago, Illinois.

Bring the fragment which can be controlled into alignment with the fragment which cannot be controlled.

The circulation distal to the fixation apparatus should be observed frequently during the first three days until all possible danger of increased swelling under snug splinting has passed.

A small insignificant fracture may mean a large disability. Reduce the fracture with as little delay as possible. It is poor practice to wait for the swelling to go down. A primary reduction will give a better result than a secondary reduction.

Examine for nerve lesions and for associated injuries before attempting reduction.

Make an exact diagnosis of the fracture first and then, if necessary, select a splint. A splint may not be needed. Splints are often harmful. No splint is used to reduce a fracture; a splint is intended to maintain reduction. Splints made to fit everybody rarely fit anybody. Make it a practice to splint effectively. When wooden splints are employed use a large amount of padding on the splint.

Treat every case of injury as a fracture until it is proven otherwise. Limit manipulation without an anæsthetic to the correction of the most obvious deformities only, for a broken bone is exceedingly painful and any motion accentuates the pain. Secure the best alignment possible, for the better the alignment obtained in reduction, especially better will be the resulting function.

Mechanical arthritis may result from static faults after partial reductions, in fractures of the lower extremity.

Voluntary active movement of joints contiguous to the fracture as early as possible without disturbing the fracture is highly desirable. Early active movement will prevent the formation of peri-articular adhesions and adhesions within joints.

In the transportation of the patient, do not underrate the importance of temporary immobilisation to relieve pain and muscle spasm and to promote clotting of blood at the bone ends. Continued pain after 24 hours is usually indicative of an incomplete reduction of the fracture or of improperly applied splints.

C.S.M.M.G. REGISTER.

THE register of members of the Chartered Society of Massage and Medical Gymnastics from July, 1920, to May, 1931, contains, besides the list of members of both sexes in the British Isles, information concerning registration, the objects of the society, and the Ling Association. In this issue of the register mention is made of the additional professional qualifications of members of the society, such as nursing, midwifery, educational gymnastics, or dispensing. A new sign indicates whether the member is on the roll of biophysical assistants, established in 1929 by the Society of Apothecaries. Chartered masseuses and masseurs who have qualified through their own society in light and electrotherapy are eligible for admission to this roll without other formality than the payment of the primary registration fee. At the end of the book an index of members, arranged under postal districts, is included; this should be convenient for the use of medical men in need of a masseuse living locally. The register may be obtained from the offices of the society at Tavistock House (North), Tavistock-square, London, W.C., for 4*s*.

Vacancies

For further information refer to the Advertisement columns.

Accrington, Victoria Hospital.—H.S. £150.

Barnstaple, North Devon Infirmary.—Res. M.O. At rate of £150.

Bedford County Hospital.—Asst. H.S. At rate of £130.

Birmingham and Midland Eye Hospital, Church-street.—H.S. £110.

Birmingham, Canwell Hall Babies' Hospital.—Second Res. M.O. At rate of £200.

Birmingham General Hospital.—Anæsthetist. £120. H.P. £70.

Birmingham, Queen's Hospital.—Third Physician to Out-Patients. £50.

Bolton County Borough.—M.O.H. £1200. Also Deputy M.O.H., &c. £750.

Bradford, Children's Hospital.—H P £120.

Bristol, City and County of.—Asst. M.O.H. £500.

British Medical Association.—Scottish Medical Secretary. £950.

Cardiff, King Edward VII. Welsh National Memorial Assn.—4 Asst. Tuber. O's. Each £250

Carlisle, Cumberland Infirmary.—H.P., Second H.S. Also H.S. to Special Depts. Each at rate of £155.

Derby, Derbyshire Royal Infirmary.—Ophth. H.S. £150.

Doncaster Royal Infirmary.—H.P. At rate of £175.

Dudley, Guest Hospital.—Asst. H.S. £170.

Durham C. C.—Asst. Welfare M.O. £500.

Edinburgh Royal Hospital for Mental and Nervous Disorders.—Asst. P. £350.

Evelina Hospital for Children, Southwark, S.E.—Anæsthetist 25 guineas. Also H.S. At rate of £120

Glasgow Eye Infirmary.—Res. Asst. H.S. £150.

Gloucestershire Royal Infirmary and Eye Institution.—H.P. At rate of £150.

Golden Square, Throat, Nose and Ear Hospital, W.—Hon. Asst. Surg. Also H.S. £100.

Great Yarmouth General Hospital.—H.S. £140.

Guildford, Royal Surrey County Hospital.—Res. Med. and Surg. O. and Reg. £250.

Harrogate Infirmary.—H.P. £150. Also Jun. H.S. £125.

Hove, Lady Chichester Hospital.—Jun. H.P. At rate of £50.

Huddersfield Royal Infirmary.—H.S. At rate of £150.

Hull Royal Infirmary.—Third H.S. for Parent Institution £150. Also H.P. Sutton Branch Hospital. £160.

Ipswich, East Suffolk and Ipswich Hospital.—4 H.S.'s and 1 H.P. Each £120.

Islington Dispensary, 303, Upper-street, N.—Asst. Res. M.O. £250.

Kidderminster and District General Hospital.—H.S. £150.

Leicester Royal Infirmary.—H.P. and H.S.'s. Also Cas. H.S. All £125.

Liverpool Heart Hospital.—Hon. Asst. Phys.

Liverpool, Royal Children's Hospital, Myrtle-street.—Res. Cas. O. £250.

Liverpool, Walton Hospital, Rice-lane.—Res. Asst. M.O.'s. £200.

London Temperance Hospital, Hampstead-road, N.W.—H.P. At rate of £100.

Longton Hospital, Staffs.—H.S. £150.

Maidstone, Kent County Ophthalmic and Aural Hospital.—H.S. £200.

Manchester, Ancoats Hospital.—Res. M.O. At rate of £150.

Manchester Royal Eye Hospital.—Jun. H.S. £120.

Margate and District General Hospital.—Res. M.O. £125.

Margate Royal Sea Bathing Hospital for Surgical Tuberculosis.—H.S. At rate of £200.

Mildmay Mission Hospital, Austin-street, Bethnal Green, E—Jun. Res. M.O. At rate of £100.

Newcastle General Hospital, Newcastle-upon-Tyne.—Three H.S.'s. Each at rate of £150.

Newcastle-upon-Tyne, Education Committee.—Asst. School M.O. £650.

Newcastle-upon-Tyne, Hospital for Sick Children.—H.P. and Sen. and Jun. H.S.'s. All at rate of £100.

Newcastle-upon-Tyne, Royal Victoria Infirmary.—Jun. Surg. Reg. £150.

Nottingham Children's Hospital.—Res. H.S. At rate of £150.

Poplar, Metropolitan Borough of.—Asst. Tub. Officer, &c. £550.

Portsmouth, Royal Hospital.—Sen. H.S. £175. H.P. and Two H.S.'s. Each £130. Also Cas. O. £100.

Preston and County of Lancaster, Royal Infirmary.—Res. Surg. Officer. £300.

Queen Charlotte's Maternity Hospital, Marylebone-road, N.W.—Asst. Res. M.O. At rate of £80.

Queen's Hospital for Children, Hackney-road, E.—Cas. O. At rate of £100.

Rotherham Hospital.—Cas. H.S. £150.

Royal College of Physicians, Pall Mall East.—Milroy Lecturer.

St. Leonards-on-Sea, Buchanan Hospital.—Jun. H.S. £125.

Scunthorpe and District, War Memorial Hospital.—1st H.S. £150.

Sheffield Royal Hospital.—Ophth. H.S. Also Anæsthetist. £120 and £80 respectively.

Sheffield Royal Infirmary.—Asst. Aural and Ophth. H.S. and H.S. and Second Asst. Cas. O. Each at rate of £80.

Southampton County Borough, Isolation Hospital.—Res. M.O. £350.

Southampton Free Eye Hospital.—H.S. £150.

Stamford, Rutland and General Infirmary.—H.S. £4 4s. weekly.

Stockport Infirmary.—H.P. £175.

Swansea General and Eye Hospital.—H.P. £150.

Swansea, Swansea and Merthyr, Tydfil, Joint Mental Hospital.—Med. Supt. £800.

Tilbury Hospital, Essex.—H.S. At rate of £150.

Wakefield, Clayton Hospital.—H.S. At rate of £200.

Walsall General Hospital.—H.P. and H.S. Each at rate of £150.

Weir Hospital, Grove-road, Balham, S.W.—Res. M.O. for War Maternity Home. £150.

West London Hospital, Hammersmith-road, W.—Res. Asst. S. £200.

Westminster Hospital, Broad Sanctuary, S.W.—H.S. to Ear, Nose and Throat Dept. At rate of £102.

Weston-super-Mare General Hospital.—Res. H.S. £150.

Wolverhampton and Midland Counties Eye Infirmary.—H.S. £150.

Woolwich and District War Memorial Hospital, Shooters Hill, S.E.—H.S. At rate of £100.

The Chief Inspector of Factories announces the following vacant appointments for Certifying Factory Surgeons at Ripley (Yorks.); Pateley Bridge (Yorks.); Stockport (Ches.); Kirkham (Lancs.).

ADDRESSES AND ORIGINAL ARTICLES

SIMPLE ACHLORHYDRIC ANÆMIA.

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(From the Middlesex and Royal Free Hospitals.)

IN this article the name simple achlorhydric anæmia, first suggested by Witts,[1] will be used to mean that form of chronic and simple anæmia found in middle-aged women accompanied by achlorhydria. Many other titles have been offered, such as cryptogenetic achylic chloranæmia,[2] pseudo-pernicious anæmia,[3] hypochromatic anæmia,[4] and idiopathic secondary anæmia,[5] but the first title seems to be the most suitable, for it draws attention to the two salient features—a simple anæmia and an achlorhydria—without in any way confusing the condition with pernicious anæmia. Attention was first drawn to it by Faber [6] in 1914, and several papers by continental observers have since emphasised the distinctiveness of the syndrome and its treatment with iron. The credit of rousing English interest in this disorder is due, however, to Witts, who has recorded his studies in recent publications.[1, 7] American work on the subject is seen in the writings of Mills,[5] Watkins,[8] Waugh,[4] and Mettier and Minot.[9]

Although the condition appears to be comparatively common, it has not been widely recognised as a distinct entity. There are many possible reasons for this lack of recognition, among which the chronicity and mildness of the anæmia, the absence of any acute form, and the prominent digestive symptoms may be cited. Indeed the multiplicity of the symptoms complained of, coupled with the listlessness shown by a chronically anæmic woman, is hardly likely to incite clinical enthusiasm. Nevertheless, once the syndrome is recognised as an entity, it is found to be a frequent source of ill-health in women, and one in which therapeutics can materially aid the patient to a return of well-being. In addition, a study of this anæmia throws some further light on the functions of the healthy stomach and its secretion.

The Clinical Picture.

The disease is far more commonly found in women than in men. In Witts' series of 50 cases, 49 were females. In my collection of 55 only four were males. Mills and Waugh also remark on the predominance of the female. In my series the maximum age incidence is between 35 and 50 years—the youngest 30, and the eldest 65. It is therefore a disease of adult womanhood. The duration of the anæmia is usually of many years, five and ten years being common. The additional gastro-intestinal symptoms may also be of equally long duration or even longer. The patient, having suffered from flatulence and pallor for so many years, often fails to fix any date to the first appearance of the symptoms—"having always been pale" and "having always suffered from indigestion."

The symptoms can be divided into two natural groups—those directly due to the anæmia and those due to the digestive disturbances. The symptoms due to the former are in no way different from those of other anæmic states, with the one exception that, as the hæmoglobin is diminished to a much greater extent than the red cells, dyspnœa may become such a prominent symptom as to incapacitate a person from daily work and yet the red cells number above four million. One of the males of the series was a blacksmith, quite incapable of performing his work, although his red cells stood at five million, but his hæmoglobin was only 50 per cent. This state contrasts with that seen in a patient with pernicious anæmia, who is usually at work until the red cells have fallen below three millions.

The alimentary symptoms, although of varying degree, are present almost without exception. Discomfort and fullness after food, a poor appetite, and flatulence are common. These, again, are of long-standing and may dominate the picture for a number of years. The anorexia may be more marked in the morning and improve towards evening. Discomfort is worse after meat and least after carbohydrate foods. In consequence the diet becomes one of bread, potatoes, milk puddings, and tea, the patient being led by her symptoms to believe that other foods are definitely injurious. Many of the patients, when asked, remarked on their loss of desire for any change in diet; they had not touched meat for years, and they were satisfied if they ingested small and frequent carbohydrate feeds.

Symptoms suggestive of visceroptosis can often be elicited from these patients and, indeed, some have resorted to abdominal supports. Diarrhœa was not complained of by any of the observed cases. Although the digestive symptoms are of varying severity they appear to be far more constant than in pernicious anæmia and far more taxing to the patient. They have commenced in such an insidious manner that it is difficult for the patient to give any exact information about their onset.

The appearance of the patient is characteristic in the fully developed case, for the complexion has a peculiar sallowness—almost a lemon tint, as seen in pernicious anæmia—and the sclerotics show a bluish colour; the picture thus does not resemble secondary anæmia from hæmorrhage. The patients are often underweight, and the wrinkles, and folds of inelastic skin contrast with the rotound appearance in pernicious anæmia. Many of my patients were grossly underweight—some only 6 st.—another result of their poor intake of food. The patients often exhibit fissures and painful cracks at the angles of the mouth, and this is accompanied by a well-marked atrophic condition of the tongue mucosa. The more severe the anæmia, the more angry and red does the bald tongue appear, but it is uncommon to obtain complaints of soreness of the tongue. In a few the tongue shows less marked changes, the only observable lesion being atrophy of the papillæ. In this series only five out of 55 showed no tongue changes. The high frequency of a glazed tongue is therefore a valuable diagnostic feature, and more constant in this condition than in pernicious anæmia.

Another characteristic abnormality exhibited by these patients is seen in the nails, which may be unduly brittle, tend to split longitudinally, are commonly flat and sometimes "spoon-shaped"—"koilonychia." Kaznelson [10] drew attention to these nail changes, and emphasised the improvement obtained on adequate treatment. Four of the present series showed the extreme spoon-shaped changes, while 31 complained of excessive brittleness and tenderness, and 26 showed flattening. These nail changes seem to be peculiar to this disease and are not found in pernicious anæmia.

When the anæmia is marked the spleen is often palpable, but not greatly enlarged. With improvement in the anæmia the spleen returns to its normal size. The abdominal wall is atonic and inelastic, and frequently the abdominal aorta can be palpated with undue ease.

The anæmia is more obvious during and after a pregnancy, to improve somewhat later. One of my patients required active treatment during her pregnancies in 1925, 1927, and 1929, but in between the pregnancies, although pale, she was able to do her work. Another gave a similar history during two pregnancies; she improved on their termination, but remained pale. Menstrual irregularities are also recorded; six women complained of amenorrhœa and four of excessive bleeding. So severe was the bleeding in two that radium treatment was contemplated. With the improvement in the anæmia, these patients also showed an improvement in the menstrual cycle. Two of the women gave histories of hæmatemesis, one 23 years previously, and the other 11 years previously, but the majority gave no history of abnormal hæmorrhage, so that the anæmia cannot be accounted for simply by loss of blood.

THE BLOOD.

While there is generally a marked reduction in the hæmoglobin content the red cells are often surprisingly normal. When the hæmoglobin is 40 per cent. or less, it is quite common to find the red cells at four million. The colour-index is therefore much below unity. The average hæmoglobin content of the present series was 52 per cent. and the average red cell count 3·9 million. The lowest hæmoglobin percentage was 25 and the lowest red cell count 2·58 million. No marked abnormality is found in the red cells other than those common to secondary anæmia. Some show a low average diameter, such as 6·9 μ, while others are normal. Witts[1] frequently found microcytosis, but a few patients may show the reverse condition—macrocytosis and a high average red cell diameter. While the majority of my patients showed no abnormal features in the blood films, except those of secondary anæmia, three—two male and one female—showed an average red cell diameter of 7·8 μ and macrocytes. The three were over 55 years of age and are probably examples of the intermediary type between this syndrome and pernicious anæmia.

Some cases show a very minor degree of anæmia; four of this series of 55 showed hæmoglobin values above 70 per cent., although the other features of the disorder were quite manifest on examination. This is of some importance, for it shows that the tongue and nail changes, accompanied as they are by the symptoms of indigestion, may precede the development of anæmia; but the anæmia in such a case may develop rapidly as a result of any aggravating factor —e.g., menorrhagia or pregnancy.

The white cell count in this series varied between 3000 and 7600, counts of 3000–5000 being usual in the more anæmic cases. With improvement in the blood hæmoglobin, the white cells, if previously low, increase to a more normal figure. None of the patients had a leucocytosis.

There is no evidence of increased hæmolysis, for the serum bilirubin is always low and in consequence the serum is pale, a finding which suggested the name "hypochromatic anæmia" in contrast to hyperchromatic or pernicious anæmia.

The blood examination shows, therefore, evidence of a secondary and simple anæmia, the result of hæmoglobin deficiency, which is not due either to blood loss or to excessive hæmolysis, and which is not accompanied by any evidence of a primary marrow disease.

THE GASTRIC SECRETION.

The gastric secretion is of more than usual interest in this condition; indeed the achlorhydria that is commonly found may be, as in pernicious anæmia, the basal and underlying factor in the development of the syndrome. On ordinary fractional analysis, in addition to the absence of free hydrochloric acid, two other features are observed: rapid emptying-rate and increased viscosity of the juice. Emptying-rates of half an hour to one and a half hours are usual, as in all achlorhydric states. Owing to the increased mucus content it is difficult to aspirate the juice. These three findings, the absence of free hydrochloric acid, the increased mucus content, and the rapid emptying-rate, are indicative of a pathological state of the stomach, and are in keeping with the marked symptoms of indigestion.

A clearer understanding of the extent of this deranged secretion is obtained when the juices are examined, before and after the subcutaneous injection of histamine. Of 24 patients of the series who were submitted to the injection of histamine, 12 showed free hydrochloric acid in the samples of juice withdrawn after injection. A further four showed a fall in pH, but not of such a concentration as to be titratable as free hydrochloric acid. In other words, 16 of these 24 patients were not completely incapable of secreting hydrochloric acid, but did so only under stimulation; while eight failed to secrete acid even under stimulation.

Pepsin was demonstrated in 19 out of 25 patients, either in the resting juice or in the samples of juice after histamine injection. In no case was the pepsin secretion found to be as much in health (250–500 units), the average figure being only 70 units. Six showed no pepsin secretion, as well as no acid secretion—true achylia.

A typical result of histamine stimulation is shown in the following figures (Table I.) from a woman aged 44, with a previous achlorhydria on ordinary gastric analysis and exhibiting a mild degree of anæmia (red cells 3·76 million; hæmoglobin 46 per cent.)

TABLE I.

—	Resting juice.	After histamine injection.	
		10 min.	20 min.
Volume	20 c.cm.	15 c.cm.	12 c.cm.
Appearance ..	Cloudy.	Clear.	Clear.
Mucus	+ + +	+ +	+ +
pH	7	7	3
Hydrochloric acid ..	0	0	15
Pepsin	4	64	120

Such a response is obtained in the larger number examined, and presumably is a fair index of the state of the gastric secretion of the majority of the patients. This secretion, with its diminished hydrochloric acid and pepsin content and its excessive mucus, would be consonant with "gastritis."

It is interesting to compare this state of affairs with that seen in pernicious anæmia. In both, an ordinary gastric analysis would disclose an achlorhydria, but, while the achlorhydria in this condition is often only "apparent" or "relative," it is "absolute" in pernicious anæmia even when the patient has returned to health—i.e., the reaction of the stomach juice remains constant. Again, in this syndrome pepsin is still being secreted while there is an absence of pepsin in pernicious anæmia—a true achylia. Finally, mucus, a feature so prominent in the juices of this simple anæmia, is absent in pernicious anæmia.

Examination of the gastric secretion in the syndrome of simple achlorhydric anæmia therefore discloses a marked degree of gastric disturbance, but not of such a severe grade as in pernicious anæmia. The fact that the symptoms are more obvious and distressing is probably accounted for by the fact that the juices are so viscid.

Contributory Factors in Development of the Disorder.

Although the cause of the disease has not been proved, a consideration of the clinical features is highly suggestive of a nutritional disorder. The disease is always chronic, no acute form having been described; it is amenable to iron therapy, and therefore cannot be a primary blood disease; it is not materially influenced by the administration of stomach or liver extract, and therefore the deficiency present in this syndrome cannot be of the same nature as in pernicious anæmia. The two important positive features which may contribute to the genesis of this disorder are the diet and the gastric secretion. The most outstanding feature is the lack of meat ingestion. Many of the patients, on questioning, say that they have not taken any red meat for years, for the obvious reason that they suffer discomfort from meat eating. The same applies to green vegetables. The diet is mainly composed of concentrated starchy foods, of which bread is the chief. Fish is taken without any discomfort. It must be remembered that this diet, poor both in protein and in mineral elements, has been the mainstay of these patients for years. Such a diet is analogous to the diet of tropical countries where anæmia is common.

A similar anæmia produced by feeding polished rice to rats was found by Hart[11] to be as amenable to beef as to liver for re-establishing the hæmoglobin. Bunge,[12] who studied the iron content of the common articles of food, drew attention many years ago to the poor iron content of cereals, and deplored the fact that in the production of fine wheat flour the iron contained in the wheat had been diminished to a fifth of its original value. His emphatic words on the mistakes of treatment adopted for anæmic women in those days are worth quoting: "We may take as an instance the poor bloodless seamstress who eats white bread and drinks tea. With the aid of all our chemical knowledge, we could not give to animals which we wished to make anæmic any food with less iron in it." Milk, rice, and potatoes are all poor in iron, and while red meat contains 17–20 mg. of iron per 100 g. of dried substance, wheat flour contains only 1·6 mg.

Knowing, therefore, that the patients exhibiting this syndrome partake of such a diet for so many years it is justifiable to conclude that their iron intake is poor and liable to result in an iron deficiency. But although a dietetic abnormality is exhibited by the majority, it must be conceded that such an unbalanced diet does not invariably result in an anæmia. On such a restricted diet many patients with a gastric ulcer retain normal blood figures. However, in this syndrome, in addition to the abnormal diet, there is a highly abnormal gastric secretion. It does not appear to be of essential importance to discuss which is the primary condition; it may well be that the gastritis is the initial lesion and the abnormal diet the sequel, but, be this as it may, it seems without doubt that both factors exert an injurious effect, the one on the other.

A recent study by Mettier and Minot[9] sheds important light on the rôle of achlorhydria in this syndrome. Judging the rate of iron absorption by the increase of reticulocytes in the blood stream, they were able to demonstrate that if, after an initial rise due to the ingestion of iron salts, the iron was again given in an acid medium in such a way that the duodenal and jejunal juices were kept acid for a number of hours, a second reticulocyte rise was obtained. From this work it is inferred that the absorption of iron, like that of other minerals, is impaired when there is an absence of free hydrochloric acid, and that a person who shows achlorhydria is susceptible to the development of a simple anæmia which is the result of this lack of iron absorption. They refer to the work of Mitchell and Miller,[13] who found that spinach (rich in iron) was of maximum potency in regenerating the hæmoglobin of the experimental anæmia of dogs when it was given in the form of the acidulated ash. If, in addition to achlorhydria, there is a dietetic deficiency, then two factors are present—a poor intake of iron and a poor absorption of iron.

In this achlorhydric anæmia the diet is deficient in iron and there is a gastritis resulting in absence of hydrochloric acid—two factors with the same end-result—an anæmia which is quickly relieved by the administration of iron.

If a person is severely anæmic as a result of bleeding from a peptic ulcer, there is usually a rapid rise of hæmoglobin and red cells, and seldom is any hæmatinic remedy called for, although the red cells and hæmoglobin may reach a very low level, despite a rigid diet of milk and other foods poor in iron. In these patients the iron stores of the body are probably readily available, and, in addition, the gastric secretion is powerful, resulting in a optimal absorption of the available iron. Those, on the other hand, who are resistant to return to normal levels are either shown to be continuously oozing or are often shown to possess no free hydrochloric acid.

Such a failure to respond was observed in a woman who had a copious hæmatemesis the day before she came under observation. She showed a hæmoglobin percentage of 15 and a red cell count of 2·4 million. Although no further evidence of bleeding was found, the hæmoglobin did not rise above 25 per cent. for nine weeks, and it was only 45 per cent. two weeks later; she showed, however, achlorhydria with excess of mucus, although no organic cause could be found on radiographic examination. This patient had suffered from "gastritis" for years, and had complained of pallor for the previous seven years. Is the delay to return to normal blood values exemplified by this patient related to her gastric deficiency?

The rapid response of the patient following bleeding from an ulcer may therefore be the direct result of his powerful gastric secretion, while that person showing achlorhydria is already at a disadvantage with low and impoverished iron stores through a long-standing deficient absorption of iron from the food.

ANÆMIA AFTER GASTRECTOMY AND GASTRO-ENTEROSTOMY.

The presence of secondary anæmia following gastrectomy and gastro-enterostomy is well known. It appears that the incidence of anæmia in gastrectomy depends on the extent of the gastrectomy, and an interesting paper by Morley[14] has also suggested that the rate of emptying is an important factor in the development of the anæmia; the more quickly the stomach empties the more likely the development of anæmia. He has shown how the Schoemaker operation of gastrectomy, with its longer gastric retention of food, is not usually followed by manifestations of anæmia, while a Polya is frequently followed by a secondary anæmia. In addition to anæmia, typical and advanced atrophic tongue mucosal changes can be seen in patients years after gastro-enterostomy. Gordon Taylor and colleagues[15] noted a similar atrophic mucosa of the tongue following gastrectomy. Since all the manifestations of this syndrome of achlorhydric anæmia can be seen in such surgical cases it appears unnecessary to catalogue them separately; they can be regarded as examples of the complete syndrome in which the operation of gastrectomy or gastro-enterostomy has produced the changes essential to the development of the disorder.

Seven of the present group of 55 were patients who had had a gastro-enterostomy performed many years previously, between 25 and 4 years before the manifestations of anæmia. As is seen from Table II., six showed varying degrees of anæmia, while the seventh (No. 6), although showing typical changes in the tongue and in the nails, still possessed a good hæmoglobin level. The first case showed extreme nail changes, while five complained of brittleness and flatness of the nails. No free hydrochloric was obtainable on ordinary fractional analysis, although one patient did show hydrochloric acid after the injection of histamine. Inquiry into the diet disclosed the same dietetic faults in four of the seven cases, while the remaining three were in the habit of taking some meat daily.

TABLE II.—*Post Gastro-enterostomy Anæmia.*

—	Sex.	Age.	Time of operation (years ago).	Red Cells.	Hæmoglobin per cent.	Tongue	Nails.
1	F.	37	16	3·0	33	Glazed.	Spoon-shaped
2	F.	42	10	4·0	55	,,	Flat and brittle.
3	M.	56	4	3·6	56	Sl. gl.	Nil.
4	F.	52	20	4·6	57	Glazed.	Flat and brittle.
5	F.	42	7	4·2	40	,,	,,
6	F.	56	25	4·9	85	,,	,,
7	F.	45	17	2·8	35	,,	Brittle.

Gastric Juice.—Achlorhydria in each case.
Sl. gl. = Slightly glazed.

The response to iron administration was as good in five of these operated cases as in the "idiopathic" cases. It appears, therefore, that when an operation produces a change in gastric function, such as to result in achlorhydria and rapid emptying, there is a danger of constitutional sequelæ—anæmia, atrophy of the tongue mucosa, and brittleness of the nails. An inadequate diet would accelerate this anæmia, and iron administration would correct it, as well as improving the state of the nails and tongue mucosa.

THE PLUMMER-VINSON SYNDROME.

In considering the cause of this disorder, the syndrome first described by Paterson[16] and Brown Kelly[17] and now called the Plummer-Vinson[18] syndrome, deserves attention. In addition to the dysphagia, there is a long-standing anæmia, atrophy of the tongue, pharyngeal and œsophageal mucosa, a sallow complexion, painful cracks at the angles of the mouth, and changes in the character of the nails. Indeed, the syndrome differs only in the additional dysphagia. Study of the gastric secretion is difficult in this syndrome, but of six examined by R. D. Owen and myself four showed achlorhydria and two showed a secretion of acid after the injection of histamine. Cameron[19] and Witts[1] have also made similar observations; in some cases achlorhydria was found, but it does not seem so common a feature as in simple achlorhydric anæmia.

The laryngologists are inclined to believe that the dysphagia is the primary abnormality, but it appears that atrophic changes are always observed when the patients first complain of dysphagia, although they may state that they have suffered from a "small swallow" for years. In any case, as a result of the dysphagia the diet is a very restricted one of "slops" and very similar to that of the syndrome under discussion.

A typical example showing the course of events is the following, in a woman aged 50, who had suffered from flatulence and discomfort after food for years and who had confined her diet to starchy foods and rarely ate meat, vegetables, or fruit. Her appetite was poor and the bowel constipated. Her swallowing gave rise to occasional difficulties, and necessitated constant caution and much patience but she had not consulted any medical practitioner for this symptom. She had recently experienced palpitations and dyspnœa, for which she sought relief. In addition to the lemon pallor, the lips showed the angular fissures, the tongue showed well-marked atrophic changes, and the nails were flat and brittle. The red cells were 3·7 million, and the hæmoglobin 40 per cent. Achlorhydria was present. As a result of iron administration she felt greatly improved and the blood showed a return almost to normal—red cells 4·6 million and hæmoglobin 80 per cent.

Remarking on the effect of the passage of an œsophageal bougie, Paterson[20] recently stated "Increased ability to swallow immediately follows the passage of a tube, and if this be reinforced by assuring the patient that she is now able to eat solid food, an improvement in the general condition is soon apparent. With the rise in the hæmoglobin content of the blood and the shrinking of the spleen, the relation of the anæmia to the restriction of food is emphasised."

A still closer relationship between these two types of anæmia is exemplified by the following case:—

A woman, aged 42, had enjoyed comparatively good health until seven years ago when, for stomach pains and evidence of an ulcer, a gastro-enterostomy was performed. After the operation digestive symptoms reappeared and the appetite failed. For the last six years the diet has been grossly deficient and anæmia has become apparent. Twelve months ago the tongue mucosa was noted as atrophic; she had frequent cracks at the angles of the mouth, the sclerotics were bluish, and the nails were flat and brittle. The blood showed the usual features: red cells 4·2 million and hæmoglobin 40 per cent. Achlorhydria was present, with hydrochloric acid secreted after histamine.

In other words, the case was typical of simple achlorhydric anæmia. Within the last year dysphagia has appeared and has increased in severity. The condition is now that of the Plummer-Vinson syndrome and the sequence of the gastro-enterostomy, then the anæmia and the atrophy of the mucosa, and lastly the dysphagia, suggests that the primary change in the syndrome is that of the atrophy and that the dysphagia is secondary.

The effect of pregnancy on this simple anæmia is also of some interest. Attention has already been drawn to the exacerbations, the patient obtaining some symptomatic relief with the termination of pregnancy. It is believed that the offspring obtains most if not all of its iron through the placenta, and since the iron content of the liver and other solid organs is high at birth it is reasonable to conclude that pregnancy results in a great depletion of the maternal iron stores, and in consequence an exacerbation of the anæmia in those whose stores are low. Recently Strauss[21] described three cases of this syndrome in women who were pregnant, and in whom the anæmia had become apparent during the pregnancy. In the three the effect of iron therapy was striking.

Metabolism studies on iron in this disorder are lacking, although there is uniformity in the reports of the beneficial effect of iron. As long ago as 1895 Kunkel[22] showed that the liver, spleen, and blood of animals contained an excess of iron after the administration of iron salts with the food. It is now believed that iron, in whichever form it is given, can be demonstrated in increased amounts in such organs as the liver. Recent estimations of the iron in the serum[23] (as distinct from that contained in the hæmoglobin) have shown that, while in pernicious anæmia there is an increase in this value, in some cases of long-standing secondary anæmia as great a decrease is found as in animals rendered anæmic by repeated blood loss. When iron was given to such persons the improvement noted clinically corresponded with an increase in the serum iron. It must, however, be stated that such low values were obtained only seldom, and many cases of secondary anæmia examined by Riecker showed no fall in the serum iron. From these observations he concludes that medicinal iron is seldom required.

The important ætiological features, then, are the deficient diet, poor in iron, the achlorhydria with its impaired absorption of iron, and the simple anæmia with its deficient hæmoglobin and its therapeutic response to iron. All these support the conception of a primary iron deficiency as the essential cause. That such a syndrome develops after gastro-enterostomy (many years after operation) is also in keeping with the hypothesis of an iron deficiency. That a similar picture is also seen in the Plummer-Vinson syndrome further supports the conception of an iron deficiency. I suggest that the first change to occur is the "gastritis," a slow and insidious process, possibly the effect of a blood-borne infection; the result of the "gastritis" is seen in the symptoms of indigestion, and gradually the diet becomes more and more restricted to carbohydrate foods; the iron of the body becomes gradually depleted, and through both factors—a deficient iron intake and a defective iron absorption—this depletion is further enhanced; the production of hæmoglobin fails and anæmia becomes more a prominent feature of the syndrome. When iron is given the anæmia improves.

The Importance of the Disease.

The condition is of importance not only on account of its frequency in middle-aged women, causing a chronic state of anæmia and invalidism, but also because of the widespread nutritional changes that are seen in the fully developed syndrome. Indeed, it appears that the secondary anæmia, the atrophic changes in the tongue mucosa, and the abnormal brittleness of the nails are all manifestations of one and the same deficiency; for not only does the anæmia improve on the administration of iron but, in addition, the tongue mucosa becomes more normal and the nails less brittle and (if previously mal-shaped) grow normally.

The nail changes have only been observed in this disorder and the allied malady, the Plummer-Vinson syndrome. They are not encountered in advanced anæmia and in pernicious anæmia, the nails are always normal to all appearances, so that anæmia *per se* does not materially alter them. But, as has already been suggested, it is highly probable that in both conditions, simple achlorhydric anæmia and Plummer-Vinson syndrome, an iron deficiency is present. Furthermore, since improvement in the character and shape of the nails follows the administration of iron it can be concluded that the bad condition of the nails is intimately related to a long-standing iron deficiency.

Atrophy of the tongue mucosa is seen in many diverse conditions. It is often well marked in pernicious anæmia, subacute combined degeneration of the cord without anæmia, sprue, ulcerative colitis, cœliac rickets, intestinal strictures, and many other alimentary lesions. I have recently observed two cases with repeated intestinal hæmorrhage over a period of three months, and both have developed a glazed tongue while under observation. That the tongue mucosa shows an improvement after liver or stomach extract has been noted by several observers,[24] [25] and Keefer[26] shows photographs of the improvement in cases of anæmia following upon correction of the malnutrition. Similar improvement in the tongue mucosa after iron can be observed in the patients with simple achlorhydric anæmia. Although no actual regeneration of papillæ can be noted, the tongue ceases to be bald and smooth, and becomes less red. The almost constant changes in the tongue in this syndrome and the absence of any history of soreness of the tongue are suggestive of a nutritional disorder, and again may be related to an iron deficiency.

If, therefore, these changes of cutaneous and epithelial structures are nutritional in origin and eventually prove to be an indication of an iron deficiency, then further functions must be attributed to iron in the maintenance of general nutrition.

The relationship between the genesis of this simple anæmia and surgery of the stomach is also of some importance. Such a complication cannot be common, although it probably occurs more frequently than has been realised. That achlorhydria is essential to the development of the syndrome in these operated cases seems also true and, since Lindsay and Evans[27] showed that in a series following gastro-enterostomy only 18 per cent. had persistent achlorhydria, it can be concluded that only a minority possess this disadvantageous state of achlorhydria and therefore become liable to a secondary anæmia. With this achlorhydria, coupled as it is with a rapid emptying, there is a danger of a defective absorption of iron from the food, and when this is further associated with a diet poor in iron, then a chronic anæmia is most likely to develop. It is sometimes difficult to regard the secretion of hydrochloric acid as a valuable asset, when one is confronted with the complications of gastric ulcer, but hydrochloric acid is a normal secretion and, when any mechanism such as gastro-enterostomy results in its suppression, the result may be chronic anæmia.

Relationship to Pernicious Anæmia.

For some years it was thought that the gastric defect played little part in the development of pernicious anæmia, but recent work has shown that the gastric achylia is the real and essential basic lesion. It might be asked, since achlorhydria is found in both types of anæmia, why one person should develop a simple secondary anæmia and another a primary anæmia; for in both the achlorhydria has been in existence for years. There are, however, certain differences.

In the primary type of anæmia the customary history is that the patient, although troubled with a certain degree of flatulence, has been able to digest normal food, and that he has only suffered from anorexia with the advent of the anæmia. Again, examination of the gastric secretion shows the absence of both acid and pepsin; as a result of this atrophic function there is eventually a deficiency in the supply of the necessary factor for the normal maturation of the red cells, with its consequence—a megalocyte anæmia. In spite of the absence of hydrochloric acid, the diet has been so varied throughout the years before the onset of anæmia (Cornell[28]) that adequate absorption of iron has taken place, and, in consequence, although a failure in red-cell production may occur at any time, sufficient iron is available for hæmoglobin production, and the colour-index remains above unity.

This contrasts with the state of affairs in the simple type of anæmia, where the diet has been abnormal for years. The intake of iron has been deficient and, through the absence of hydrochloric acid, the absorption of the little iron present has been defective.

The continued secretion of pepsin and the appearance of acid in some of the patients on stimulation with histamine suggest that the gastric lesion is not of the type which leads to a deficiency, as seen in pernicious anæmia—a deficiency in red-cell production. With the long-standing defective diet and the poor absorption of iron, failure of hæmoglobin production becomes the essential feature, while the red cells are more or less unaffected. That achlorhydria does not of necessity result in an iron deficiency is shown not only by patients with pernicious anæmia (in whom there is always sufficient iron available), but also by more or less normal people who show no anæmia, in spite of achlorhydria. These people generally complain little of indigestion and enjoy a normal diet and, in consequence of this normal diet, presumably are able to ingest sufficient iron for their requirements.

Since both types of anæmia are so intimately related to gastric function, it would not be surprising to meet an intermediate type possessing characteristics of both a primary and also a simple anæmia. Such cases are not common. Six individuals of the present group showed a complete achylia—a secretion identical with that encountered in pernicious anæmia.

A female, aged 48, with a moderate degree of anæmia had 3·9 million red cells and 44 per cent. of hæmoglobin. She showed a good response to iron in spite of the achylia. Time only will prove whether, with such a secretion, the patient will show characteristics of a primary anæmia and will need liver in addition to iron to remain well. It is probable that years must elapse before such a deficiency is made obvious, for it is known that an abnormal gastric secretion has been found 15–20 years before the development of any manifestations of anæmia.

Another who showed achylia was a man aged 58; when first seen in 1929 he showed a severe degree of secondary anæmia—red cells 2·6 million, hæmoglobin 26 per cent. The tongue surface was atrophic, the spleen was palpable, and the nails were normal. As a result of liver extract his blood count rose in nine weeks to: red cells 4·5 million and hæmoglobin 80 per cent. He took no further liver for a period of eight months, when he developed an equally severe grade of secondary anæmia, which again responded to liver extract.

It appears that if an anæmia, although of low colour-index, is characterised by a big reduction in the red cells and also macrocytosis in the blood films, and this be associated with a true achylia, the administration of both liver and iron may produce a better response than either would alone. Such an anæmia is far less common than the ones "true to type."

In Table III. the chief differentiating features between the two types of anæmia are shown.

TABLE III.

	Simple achlorhydric anæmia.	Pernicious anæmia.
Duration of anæmia	Indefinite; 5–10 years or more.	Two years max.
Gastro-intestinal symptoms ..	Usually marked and long-standing.	Not prominent.
Diet	Abnormal for years.	Normal.
Tongue mucosa ..	Atrophic changes constant.	Atrophic changes less frequent.
Nails	Changes common.	None.
Neural signs ..	Uncommon.	Common.
Bilirubinæmia ..	Decreased.	Increased.
Gastric secretion ..	Achlorhydria.	Achylia.
Red cells	Not greatly reduced; microcytes.	Marked reduction; macrocytes.
Hæmoglobin ..	Relatively low.	Relatively high.

Treatment.

"But even if the assimulation of inorganic iron was a proved fact, it would have no importance in medical practice, since, as our experiments show, the iron required for the formation of hæmoglobin is much more readily and plentifully assimilated from the organic iron compounds of our normal dietary. Hence there is in no case any reason to prescribe preparations of iron for the production of hæmoglobin in people who can take their natural food with a good appetite."

Thus did Bunge[39] state his views on the therapeutics of iron in 1889. The further observations of clinical experience have not resulted in any essential alteration in this statement, and, in fact, it is peculiarly apt when this disorder and its response to treatment are considered. For, as has already been emphasised, the food partaken of by these patients is far from being normal or natural, neither do they possess a good appetite. In consequence, if it is agreed that there is an iron deficiency in this disease, material improvement following iron administration should be expected, and upon this there is general agreement, provided iron is given in sufficiently large doses. Satisfactory results have been published by Kaznelson,[10] Meulengracht,[30] Witts,[31] Schulter,[32] and others.

I used ferri et ammon. cit. in doses of grs. 60–90 a day. Provided this is taken over a period of 6 to 12 weeks, there is a decided rise in the hæmoglobin; indeed, the clinical improvement is as striking as that observed in pernicious anæmia with stomach or liver extract. After many years of chronic anæmia the return of a normal hæmoglobin content is accompanied by a well-being which is very new to these invalids.

Of the present series of cases some were only seen once, to obtain treatment elsewhere, some were given additional hæmatinic remedies, others were careless and did not persevere with treatment, while the remainder—those that faithfully ingested the iron as prescribed, over a sufficiently long period—invariably showed a rise in the hæmoglobin as well as a striking improvement in the general health. Table IV. gives the red-cell and hæmoglobin values before and after iron administration in patients who were not given any other form of treatment. An improvement in the hæmoglobin was obtained in all, but as the blood estimations were not done regularly "the duration of treatment" is a somewhat arbitrary figure.

TABLE IV.—*Response to Iron.*

Case.	Initial blood count.		End-result.		Iron Med.†	Case.	Initial blood count.		End-result.		Iron Med.†
	R.C mill.*	Hb. %	R.C. mill.*	Hb. %			R.C. mill.*	Hb. %	R.C. mill.*	Hb. %	
1	3·3	30	5·2	95	2 m.	28	4·6	57	5·0	95	2 m.
3	4·05	55	5·0	96	2½ m.	29	4·3	46	5·2	82	3 m.
4	5·0	52	5·75	85	6 w.	30	3·8	25	4·8	84	3 m.
5	4·8	48	5·0	98	3 m.	31	3·7	40	4·6	80	3 m.
17	2·8	35	4·9	75	3¼ m.	32	4·7	53	5·0	92	2¼ m.
18	3·8	48	5·2	86	2½ m.	33	2·4	40	4·0	85	2¼ m.
20	4·6	65	4·8	110	2¼ m.	34	4·3	30	4·5	82	4 m.
21	3·76	46	5·4	70	6 w.	35	4·7	38	4·8	84	3 m.
23	2·5	25	4·6	75	3 m.	36	2·5	22	4·5	70	5 m.
26	4·1	42	4·9	85	2½ m.	52	3·1	34	4·3	78	3 m.

* R.C. mill. = red cells in millions. M. = months; w. = weeks.
† Iron med. = duration of iron medication.

No untoward symptoms have been noted as a result of the ingestion of these large doses of iron, and only one patient was unable to tolerate grs. 25 three times a day. It is not known why such large doses are necessary, and little is known of the fate of the iron that is absorbed, other than its storage in the liver. It is necessary to continue with smaller doses of iron to prevent relapse, as was shown by some of this series in whom the hæmoglobin fell to its original level of 40 per cent. or so in six months on the cessation of iron therapy. When once the hæmoglobin has reached the 95–100 per cent. level the dose was reduced to gr. 10 three times a day.

In addition to the improvement in the anæmia, the nails and tongue changes become less marked, and in some patients the original departures from normal have completely disappeared, although no actual regeneration of papillæ has been observed in the tongue mucosa. Furthermore, some patients show a gain in weight following general improvement; one patient increased in weight from 6 st. 8 lb. to 7 st. 8½ lb. in nine weeks.

It is a question whether iron should be prescribed to the individuals who show achlorhydria, atrophic changes in the tongue, and undue brittleness of the nails without any marked reduction in hæmoglobin. Several such patients have been given iron and, although exact proof of benefit is difficult to record when the hæmoglobin is already above 80 per cent., yet the return of well-being and vigour has been sufficiently marked to warrant iron administration even in these cases.

The treatment of the digestive disturbances is a more difficult project. It is probable that the anæmia would gradually disappear if the gastric secretion could be re-established, and, as a result of this, appetite and hunger for meat and other articles rich in iron could return to the patient. To attain this, washing out the stomach, to free it of its thick coat of mucus, would be a direct benefit, as Hurst[33] has emphasised. Two patients, previously showing achlorhydria on ordinary fractional analysis, showed a return of acid on a similar examination three and four weeks after daily lavage of the stomach; but as the rise in hæmoglobin was too slow, and domestic reasons forbade delay, these patients were later given iron in addition. Keefer[34] has recently shown that an improvement in an existing anæmia results in a better gastric secretion, and that some of his cases of malnutrition anæmia (tropical in origin), previously showing achlorhydria, showed a return of free acid when their anæmia was corrected. He concludes that achlorhydria is often the result of the anæmia. Whilst it must be readily admitted that such improvement is conceivable and natural, it would be difficult to regard the anæmia in this syndrome as the causative factor in the development of achlorhydria, for several patients with little anæmia yet show achlorhydria, and all the factors point to the gastric abnormality as the primary change. Six of the patients who showed a good response to iron alone were re-examined after they had returned to normal figures, but no improvement was noted in the gastric secretion.

The administration of hydrochloric acid has been frequently tried and applauded, but it is extremely difficult to subsidise the natural secretion. Many years ago Zander[35] claimed that hydrochloric acid administered to a patient with chlorosis was of more lasting benefit than iron, for, in his opinion, it caused a better absorption of iron from the food. Stockman[36] and others failed to confirm these observations in chlorosis. The position is much the same to-day, and the concensus of opinion seems to be that hydrochloric acid administered to a patient with achlorhydria cannot be of much therapeutic importance except in post-prandial diarrhœa. However, there are some patients in whom flatulence and discomfort after food is especially relieved by either hydrochloric acid alone or a mixture containing hydrochloric acid and pepsin. I have frequently obtained symptomatic benefit in this type of patient from a mixture containing a drachm of hydrochloric acid and a drachm of glycerin of pepsin, made up with orange or lemon water, taken after or during meals. Some patients seem to derive no benefit from hydrochloric acid; in fact it appears to increase the discomfort. Others find relief from a morning dose of alkali powder taken half an hour before breakfast; this probably acts by removing the thick coat of mucus and allowing a better gastric secretion during the meal.

Conclusion.

Simple achlorhydric anæmia appears to be a common and chronic anæmia of adult womanhood. The evidence available is suggestive of an iron deficiency, consequent on a defective diet, and an impaired gastric secretion. The disorder can be therapeutically corrected by the administration of iron, but this does not remove the cause. Attention to the gastric secretion and measures to improve it should ultimately result in a better intake and a better absorption of iron. The disease is worthy of attention, not only on account of its frequency in women and the ease of its correction from the standpoint of the anæmia, but also on account of its appearance in patients who have undergone surgical treatment to the stomach. Its development is a further index of the normal function of hydrochloric acid secretion. In addition, it is possible that the malnutritional changes, such as those in the tongue mucosa and entrance to the food passage and in the nails, are related to a long-standing deficiency of iron.

It is a pleasure to acknowledge the kindness of the honorary physicians of the Middlesex and Royal Free Hospitals in allowing free access to the patients under their care.

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CONGENITAL ELEVATION OF THE DIAPHRAGM,

WITH REPORTS ON SIX CASES.

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Congenital elevation of the diaphragm is a condition due to faulty development of this organ, as the result of which the diaphragmatic dome on one side, usually the left, forms a sac bulging upwards into the thorax and containing displaced abdominal viscera.

The condition was first recognised and described by Jean Louis Petit (1674–1750), who gave it the name of *eventratio diaphragmatica*. His collected writings, however, were not printed until nearly a quarter of a century after his death, when his pupil, Lesne, published them as a memorial of a master greatly beloved.[1] It is thus to Lesne that we owe the preservation of Petit's account of the first known case. If medical precedent had been followed and the condition were known as Petit's disease, fitting tribute would have been paid to one whose name should not be allowed to pass into oblivion.

After describing diaphragmatic hernia, Petit records another example of diaphragmatic displacement which, in his opinion, must have been due to an error in development. The patient had suffered for long from attacks of asthma, aggravated by eating, and had died after an attack of "inflammation of the stomach." At autopsy Petit discovered that the left side of the diaphragm projected upwards into the thorax, forming a large sac. The base of the left lung was glued to this by adhesions, while, on opening the belly, the sac was found to contain the stomach, colon, and mesentery, matted together as the result of recent inflammation. The diaphragm was intact, and Petit lays stress on the fact that there was no rupture in its vault nor any separation of its muscular or tendinous fibres. The case thus differed from cases previously described, in which he had noted a true hernia of the diaphragm.

Cases were subsequently recorded by Froriep[2] (1837), Lawrence[3] (1852), Howard Marsh[4] (1867), Thoma[5] (1882), Tennant[6] (1894), Kronig[7] (1898), and others in succeeding years. It is to Woodburn Morison, however, that we owe the first complete account of the condition, and his admirable monograph[8] on the subject has already taken its place among the classics of medical literature. Each of the cases of diaphragmatic eventration referred to above was discovered at autopsy, and the descriptions refer to appearances found post mortem.

The first instance of the application of X rays to the diagnosis of diaphragmatic eventration that we have been able to discover in medical literature was made in 1901 by Widenmann.[9] The patient, a man aged 48 years, who had suffered from repeated attacks of pain in the chest, was X rayed. The skiagram revealed a dome-shaped shadow projecting upwards into the left side of the thorax. Proof that this shadow was cast by the diaphragm, and that the stomach lay immediately beneath it, was forthcoming when a sound of zinc and small shot was passed into the stomach by way of the œsophagus, and could be seen curling upwards in the clear area immediately below the diaphragmatic arc.

A further application of modern diagnostic methods to the examination of the malformation was made by Baetge (1913),[10] who utilised the electro cardiogram. He claimed that the tracings showed a departure from the normal owing to the displacement of the heart to the right. We have, however, been unable to confirm this, for electro cardiograms of two of our cases, kindly taken by Dr. A. J. Scott Pinchin, showed that the wave forms were not abnormal.

A still more ingenious method of differentiating between gastric hernia and eventration was successfully employed by Hildebrand and Hess.[11] A tube passed into the stomach communicated with a manometer which enabled the intra-gastric pressure to be estimated during the two respiratory phases. Obviously, if the stomach is in the abdominal cavity, intra-gastric pressure will rise during inspiration and fall during expiration, but if the stomach is situated in the thoracic cavity—i.e., if there is hernia of the diaphragm, the reverse effect will be noted.

Ætiology.

The diaphragm is raised in many pathological conditions: (1) Certain abdominal conditions—e.g., ascites, pregnancy, subphrenic abscess. (2) Pulmonary diseases—e.g., tuberculosis, especially of the fibroid type, fibroid lung, atelectasis, neoplasm. (3) Paralysis of the phrenic nerve due to disease, trauma, or operation. (4) Temporary elevation of doubtful origin may occur in children or in adults as the result of trauma. An example of the latter is shown by the following case:

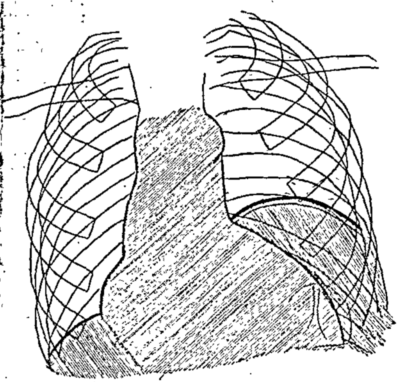
A man, aged 58, whilst working, hit the left side of his chest against an iron grating. Considerable bruising and swelling resulted, and a fracture of the lower ribs was suspected. An X ray photograph was taken but no fracture was seen. On the other hand, the left dome of the diaphragm was found to be raised to the level of about the ninth rib behind. Two months later a second film was taken. In this radiogram both domes of the diaphragm were at the usual level. All pain and swelling had disappeared and the patient stated that he was quite well. The elevation of the left dome of the diaphragm in this case thus appears to be related to the injury to the chest wall, and might be explained as a reflex phenomenon designed to prevent the pain that would have resulted from a contraction of the diaphragm on the injured side.

In all these cases the cause of the rise in the diaphragm is obvious. It is characteristic of eventration that a considerable degree of elevation is present in the absence of any demonstrable cause. There is no increase in intra-abdominal pressure, there is no disease of the lungs, and in at least one case in which a microscopical examination of the phrenic nerve was made after death, the sections showed no abnormality,[12] and though, in another case, Benda found reduction in the size of a phrenic nerve, the fibres were normal.

There seems, indeed, no reason to doubt that Petit was correct in regarding the condition as a congenital defect, for it has been found at the autopsy on a child who only lived 24 hours, and even in a fœtus. It is worthy of note, also, that in nine of the reported cases elevation of the diaphragm was accompanied by other congenital abnormalities.

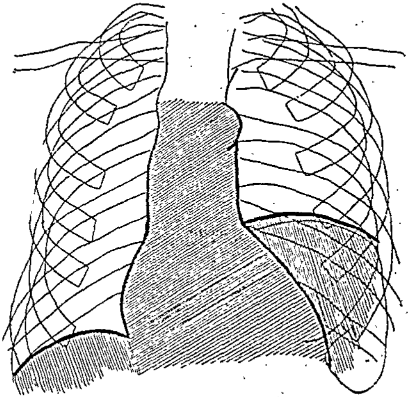
If eventration of the diaphragm is a congenital condition the development of the diaphragm is worthy of consideration. The pericardial, pleural, and peritoneal cavities of the adult are formed by subdivisions of the embryonic body cavity. The anterior end of the cœlom containing the heart is shut off by a partition which forms at about the sixth week of intra-uterine life and, at a slightly later date, the two pleural sacs are separated from the peritoneal cavity by the completion of the diaphragm. The greater part of the latter is formed from the septum transversum, which is ventral in situation, while the dorsolateral portions are derived from the pleuro-peritoneal membranes which close the communicating ducts between the two cavities on the right and left sides. The musculature of the diaphragm is stated to be developed from two muscle masses, derived from the fourth cervical myotome.[13] These grow into the developing diaphragm while the septum transversum is still in the cervical region. Later the diaphragm migrates caudally to reach its proper place.

FIG. 1 (Case 3).



A drawing of a film taken in expiration to contrast with one in inspiration. The right dome of the diaphragm is at the level of the upper margin of the anterior extremity *of the* fifth rib, and the left dome at the level of the anterior extremity of the third rib.

FIG. 2 (Case 3).



A drawing of a film of Case 3 taken in inspiration. The right dome of the diaphragm is now opposite the anterior extremity of the sixth rib, whilst the left dome, which is flatter than in the previous film, has moved down to the anterior extremity of the fourth rib. A definite contraction of the left dome of the diaphragm has thus occurred.

In congenital elevation the right side of the diaphragm is in its normal position, whilst the left cupola forms a thin sac with normal attachments, but projecting into the thorax to reach a high level. It seems, probable, therefore, that neither a failure of migration nor a failure of union of the component parts (a cause of hernia of the diaphragm) is responsible for the condition, but a failure of the development of the musculature on one side. As a result of this, the muscle sheet is almost entirely replaced by a thin membrane, which yields to abdominal pressure. Such a sequence might be expected, for the pressure in the pleural is lower than that in the abdominal cavity, and a membranous diaphragm would fail to fulfil its pressor function.

Clinical Aspect.

The malformation is generally discovered by chance in the living as the result of radiological examination or operation, or in the dead at autopsy. There are no distinctive symptoms, though dyspnœa and dyspepsia have often been noted.

The time-honoured methods of inspection, palpation, auscultation, and percussion, though we cannot afford to dispense with them, have only a limited value in the investigation of obscure disease of the chest. The excellent quality of modern radiograms of the thorax has compelled even the conservative to admit that a skiagram forms an essential part of a complete examination of the chest. In the opinion of the more progressive, an X ray examination is the essential part. It is true that a good physical examination is better than a poor skiagram, but a good skiagram furnishes more reliable information than that obtained by any other method. The application of the classical method of physical examination in one of our cases (Case 1) led to an entirely erroneous conclusion. The patient complained of dyspnœa, there was a family history of tuberculosis, the percussion note was impaired at the base of the left lung, vocal fremitus could not be felt, and vocal resonance was inaudible over the dull area. There was also displacement of the heart away from the affected side. A tentative diagnosis of tuberculous pleural effusion seemed justified. A skiagram demonstrated an elevation of the diaphragm, and a single glance at the film disclosed more than a careful clinical examination had been able to discover. The quickest method of revealing the secrets of the thorax, like those of Joanna Southcote's box, is the intelligent application of the X rays. A brief description of the physical signs will therefore suffice.

On inspection there may be diminished movement of the affected side of the chest—almost always the *left side*. The presence of Litten's sign has been noted. On palpation vocal fremitus is reduced at the left base. The results of percussion will depend upon the relative amounts of fluid and air in the stomach, a dull note being elicited over fluid and a tympanitic note over the inflated part of the organ. Tympany may extend as high as the fourth rib anteriorly. On auscultation breath sounds and vocal resonance are absent over an area approximately corresponding with the height of the diaphragm. A succussion splash is usually evident, for the stomach is rarely empty.

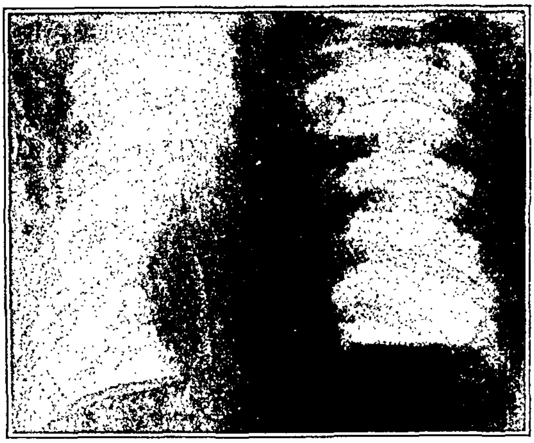
RADIOLOGICAL EXAMINATION.

The following descriptions refer to left-sided eventration.

Fluoroscopy shows the diaphragmatic movement.

During quiet respiration the unaffected dome exhibits normal excursions. These are usually well marked, but there is no evidence of exaggeration to compensate for the absence of movement on the elevated side.

FIG. 3 (Case 1).

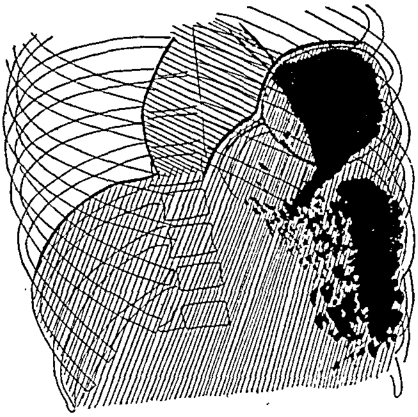


An erect anterior view taken after an ordinary meal without barium. The raised bowline of the left dome of the diaphragm and displacement of the heart to the right are shown. In addition three fluid levels are seen in the stomach, disposed one above the other.

When the patient is instructed to breathe deeply, the abnormally elevated dome will be seen to move slightly up and down, its excursions being synchronous with those of the healthy side. Only one of our cases (No. 5) showed a contrary or paradoxical movement, such as is seen in paralysis of the diaphragm. In Case 3 true contraction of the diaphragm was proved by radiograms taken in inspiration and expiration (Figs. 1 and 2).

A *radiogram* taken when the patient is recumbent shows the right side of the diaphragm in its normal situation while the left side exhibits a boldly outlined and smoothly rounded dome, the summit of which may be at the level of the second or third intercostal space. No stomach bubble can be made out in this position, but the splenic flexure, with its contained gas, is seen lying high up under the raised diaphragm. The heart's shadow is displaced to the right, and just above it the translucency of the bifurcation of the trachea is similarly displaced. Below the affected diaphragm a uniform opacity obscures the view, except in those cases in which, as noted above, some evidence of a displaced splenic flexure is found.

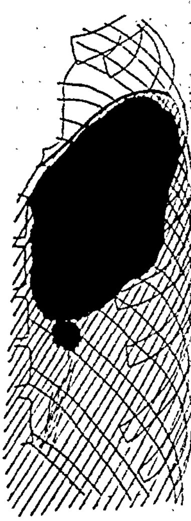
FIG. 5 (Case 6).



A drawing of a film taken prone ten minutes after the ingestion of a barium meal. The patient is rotated slightly into the right oblique position. The left dome of the diaphragm does not form an uninterrupted bowline as seen in the anterior view, but presents a bulge where the fundus of the stomach presses on the diaphragm. Barium is seen in the stomach and some barium has passed out into the smaller intestine.

When a radiogram of the patient in the erect posture is taken a very characteristic picture is obtained (Fig. 3). Where previously an opacity was observed in the left lower zone a large gastric air-bubble is now revealed above which arches the bow line of the diaphragm. The contour of this line is unbroken in antero-posterior and lateral views, but an oblique view may show a bulge (with convexity upwards) where the gastric fundus presses against the concavity of the thin and yielding diaphragm (See Fig. 2). Below the area of translucency, especially if the patient has recently enjoyed a good meal, can be seen two or more typically three-fluid levels in the stomach. If the surfaces of the fluid levels be traced to the left they will be seen to merge into the shadowy outlines of the splenic flexure with its usual gaseous content.

FIG. 4 (Case 6).

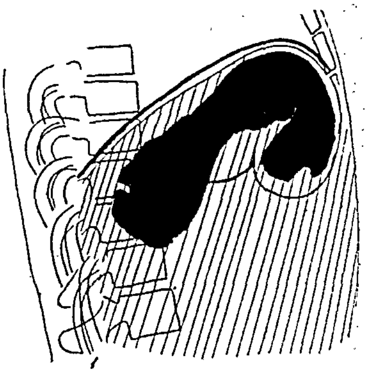


A drawing of a film taken in the prone position five minutes after the administration of a barium meal. The fundus of the stomach lies high up under the raised left dome of the diaphragm. The duodenal bulb is outlined by barium and points directly downwards. The second and third parts form a straight line instead of the usual loop.

In the erect lateral position the three fluid levels corresponding to those seen in the antero-posterior position may also be seen, but whereas in the antero-posterior position they are placed more or less vertically above each other, in the lateral position they exhibit a staircase formation, the stairs ascending from left to right.

Further information and confirmation of diagnosis can be obtained by examination after a barium meal. If the patient attends fasting, unless he is an air-swallower, the appearances mentioned above will not be well seen, for the gastric air bubble will be inconspicuous and the fluid levels indistinct or absent.

FIG. 6 (Case 6).



Drawing of a lateral prone view taken after ingestion of barium. The greater curvature of the stomach is displaced upwards, and together with the fundus follows the line of the raised diaphragm in a postero-anterior direction. The shape of the stomach has a resemblance to a bagpipe.

Barium meal examination.—The patient is placed behind the screen and rotated into the right oblique position. The barium is now administered and its progress down the œsophagus is watched. The cardiac orifice appears to be low in position in relation to the rest of the stomach. As the result of

FIG. 7 (Case 4).

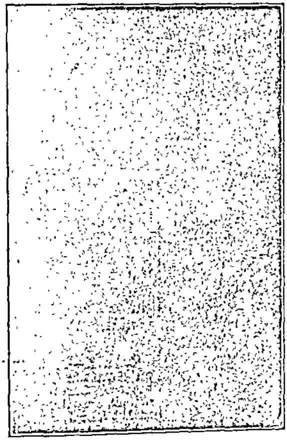


FIG. 8 (Case 4).

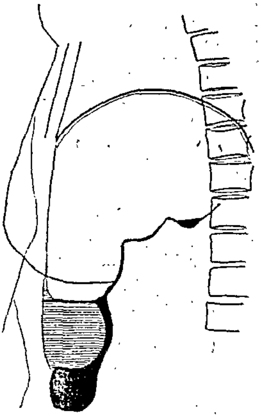


Fig. 7 is a lateral erect view of Case 4, taken immediately after some barium emulsion had been swallowed. *The barium can be seen* running down the posterior wall of the stomach and outlining three folds: (1) an upper posterior one which contains a small pool of barium, (2) a middle smaller fold, and (3) an anterior fold which runs down into the main *body of the* stomach, where there is a large fluid level.

Fig. 8 is an outline drawing of the barium meal appearances seen in Fig. 7. Compare with Fig. 10, where the arrangement was more complex.

this, the fluid on entering the stomach appears to pass upwards towards the fundus and then to pass downwards towards the pyloric end. The whole of the stomach is seen to be situated more to the eft than usual, whilst the duodenum is also displaced to he left with its bulb pointing ransversely to the right, or downwards towards the pelvis Fig. 4). It is thus obvious hat the shape and position f the stomach are abnormal. Examination with the patient ying on the back is necessary f diaphragmatic hernia is to e excluded. In this position he smooth contours of the undus are outlined by barium, nd it will be noted that none f the barium lies above the iaphragmatic level. In cases f hernia, recumbency will ause some of the barium to ass into a pouch above the iaphragm.

The appearances are equally bnormal in the lateral view. A picture taken with the patient ying down shows the smooth, urved contour of the raised ome of the diaphragm and mmediately beneath it the tomach, which is distorted so as to resemble a bagpipe n shape (Figs. 5 and 6).

We were doubtful of the correct interpretation of he three fluid levels seen in the antero-posterior nd lateral erect views until we were so fortunate as o secure a radiogram from the lateral aspect mmediately after the patient had swallowed some arium. When the picture was taken a film of arium was still adherent to the gastric mucous membrane and the *posterior* wall of the stomach was clearly delineated. A curious folding of the walls was seen *to* be responsible *for* three little pools of barium: an upper one near the œsophageal opening, a smaller one just in front of this, and a larger one more anteriorly placed, the walls of which seemed to be formed by the main body of the stomach. The lateral view thus presented the appearance of a cascade with a stream of barium connecting the three pools (Figs. 7 and 8). In Case 3 an even more complex appearance was shown in the anterior and lateral

FIG. 9 (Case 3).

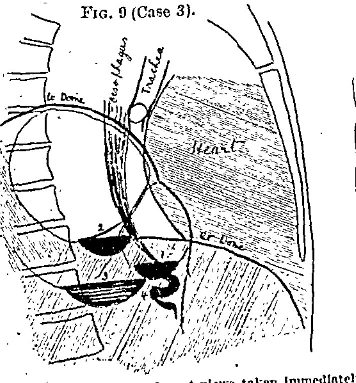
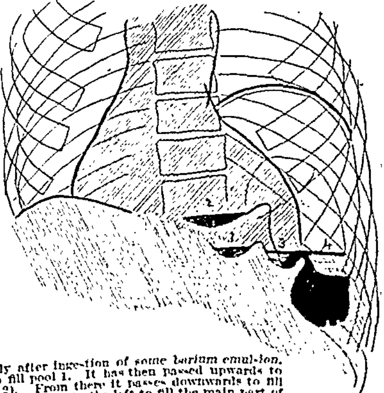


FIG. 10 (Case 3).



Drawings of anterior and lateral erect views taken immediately after ingestion of some *barium emulsion.* The barium can be seen running down in the œsophagus to fill pool 1. It has then passed upwards to fill a pool situated higher up and more posteriorly (pool 2). From there it passes downwards to fill pool 3, and from here a stream of barium is seen passing forwards and *to the left* to fill the main part of the stomach, which is situated at level 4. Four distinct fluid levels are thus present.

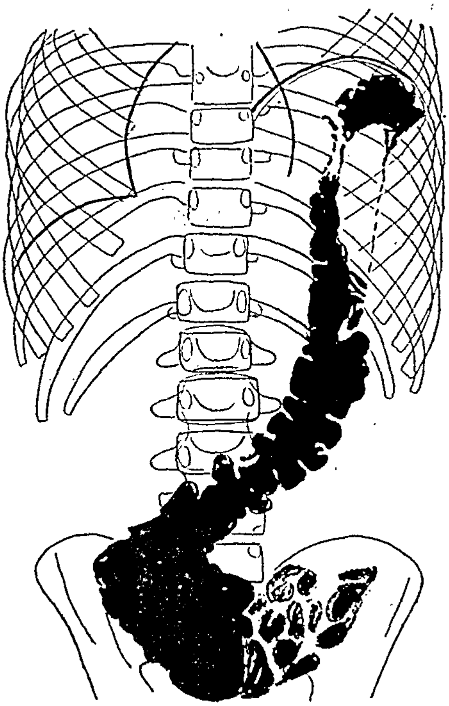
erect views, the barium outlining four possible fluid levels (Figs. 9 and 10).

If the meal is followed until it reaches the large bowel, the cæcum will probably be found in the pelvis, the hepatic flexure low in position, and the transverse colon running upwards to the left in an oblique line to meet the splenic flexure high under the raised dome of the diaphragm (Fig. 11).

Post-mortem Appearances.

Though six patients affected by eventration have attended our clinic, we have had no opportunity of comparing the results of physical and radiological examination with post-mortem findings. We have therefore had to rely on the descriptions of others when trying to visualise the pathological condition. The reported cases agree in their accounts of the displacement of abdominal organs and the appearance of the undeveloped and raised hemi-diaphragm. Petit describes the wall of the "sac" as formed of peritoneum, diaphragm, and pleura united by adhesions. He emphasises the absence of any rupture of the wall of the sac and also draws special attention to the fact that there was "no separation of the muscular and tendinous fibres of the diaphragm." Lawrence, who discovered eventration at the autopsy on a patient who had died of pneumonia, found that the muscular tissue only extended from the inner surface of the ribs and arcuate ligaments for a distance of 6–8 lines, and noted that such fibres as were present were only perceptible by transmitted light. The remainder of the left half of the diaphragm consisted of an aponeurotic expansion merging into the central tendon. An example of a partial atrophy is supplied by Tennant, who found eventration of the diaphragm in a dissecting-room subject. The elevated diaphragm formed a pouch extending to the height of the second costal cartilage. The anterior half of the left side of the diaphragm was normal, but posteriorly it was thin and translucent. Only a few scattered muscular fibres could be found in the affected area.

FIG. 11 (Case 6).



A film taken when lying down six hours after the ingestion of the barium meal. The large bowel is filled as far as the splenic flexure. A residue of barium is still present in the small intestine. The cæcum is situated at the brim of the pelvis, whilst the hepatic flexure is at the level of the right iliac crest. The transverse colon runs obliquely upwards and to the left towards the splenic flexure, which is very high in position. The hepatic flexure is thus abnormally low. (This was seen also in one of the other cases.)

Treatment.

No curative treatment is possible. Fortunately the condition seldom causes discomfort. Symptomatic treatment for any gastric disorders, should these arise, is obviously indicated. For the rest, the patient may be reassured that his abnormality is unlikely either to lessen his efficiency or to shorten his life. He enjoys the gratification of being an interesting case whose appearance at hospital will always excite a lively concern, and he suffers few of the disabilities commonly attaching to such a condition.

Case Reports.

CASE 1.—A warehouse boy, aged 16, attended hospital on Nov. 23rd, 1926, complaining of chronic shortness of breath. One week before attendance he had had a feverish attack, associated with vomiting. He had had diphtheria in 1922, and his sister had died of tuberculous meningitis.

There was impaired percussion note on the left base posteriorly, and the breath sounds, vocal resonance, and vocal fremitus were absent. The heart was slightly displaced to the right. A succussion splash was elicited at a later visit. X ray examination showed typical congenital elevation of the left side of the diaphragm.

CASE 2.—A motor driver, aged 50, attended hospital on Nov. 18th, 1930, complaining of morning cough and retching of 12 years' duration, also dyspnœa of three years' standing. Apart from these he had enjoyed good health.

There was impaired percussion note and weak breath sounds with some coarse râles at the left base posteriorly, and elsewhere signs of emphysema. The heart was slightly displaced to the right. The liver was enlarged, ? cirrhotic. The electrocardiogram showed physiological rhythm and left side relative preponderance, and the skiagram a typical left-sided elevation of the diaphragm.

CASE 3.—A retired motor driver, aged 68, attended hospital on Jan. 27th, 1931. He had been a district railway motor driver for 45 years without losing a day through ill-health till Nov. 24th, 1930, when he was admitted to the West London Hospital suffering from intestinal obstruction. At operation performed for the relief of this six or seven days later it was noticed that the left side of the diaphragm was at an abnormally high level. The patient made an uneventful recovery and went home in 23 days from admission. The X ray showed typical left-sided elevation of the diaphragm.

CASE 4.—A dressmaker, aged 21, attended hospital on Nov. 11th, 1930. The patient had previously attended Leyton Tuberculosis Dispensary as a "suspect" complaining of four weeks' cough. Her father had died of phthisis in 1919.

Breath sounds were absent at the left base posteriorly, the percussion note in the same area being of slightly higher pitch than normal. The breath sounds in the left axilla were weak. X ray examination showed a typical left-sided eventration.

CASE 5.— A piano-worker, aged 30, attended hospital on Nov. 11th, 1930, complaining of a cough which had led his doctor to suspect pulmonary tuberculosis. He had had double pneumonia in 1921, and been bed-ridden for five weeks.

The breath sounds were weak over the upper half of the right lung and absent below the angle of the scapula. No impaired resonance or alteration of vocal fremitus or resonance was found. The liver dullness extended from the fifth intercostal space to the costal margin. The skiagram showed that the right dome of the diaphragm was raised to the fifth intercostal space in the nipple line, the left dome being at the normal level; some faint mottling suggested that tuberculous foci were seen in the left mid-zone. The right costophrenic angle was obliterated. On screen examination paradoxical movement of the diaphragm was seen, a phenomenon not observed in any of our left-sided elevations.

CASE 6.—A boy, aged 12, attended hospital on Jan. 23rd, 1930, complaining of occasional "retching" not related to meals and associated with slight pain in the upper part of the left side of the "stomach." In March, 1928, he had been thrown out of a cart into a field on his stomach and admitted to Woodford Hospital for suspected abdominal injury; he had remained in hospital two weeks. He subsequently complained of pains in the left side of the chest and retching at times, but there was no vomiting. He had had similar attacks three or four times a week up to his attendance at hospital.

The patient was a poorly nourished boy, of small size for his age. There was impairment of percussion note at the base of the left lung, extending from the angle of the scapula to the base, and also in the left axillary region and anteriorly below the level of the fourth rib. Breath sounds, vocal fremitus, and vocal resonance were absent in this area. No succussion splash was heard on shaking the patient. A skiagram showed a typical left-sided elevation of the diaphragm.

H. G. Wells has suggested that the discovery of the secret of cancer will be made, not by a philanthropist burning with zeal to relieve the sufferings of his fellows, but by a laboratory worker consumed with an eager curiosity that has no direct connexion with humanitarian motives. The condition we have been considering may at first sight seem to be one of small practical importance. The subjects of this curious deformity are few, their sufferings are negligible; we can do nothing to restore a normal balance to the organism. But the curiosities of medical practice have their value if they stimulate the inquiring attitude of mind, and the study of even the rarest abnormalities of development may ultimately assist us to a knowledge of how to prevent the congenital deformities which in their graver manifestations are the cause of serious disability or even acute suffering.

Our thanks are due to Dr. A. J. Scott Pinchin, Dr. K. Shirley Smith, Dr. T. L. Ormerod, and Dr. H. T. Howell, who kindly allowed us to make use of their cases, and also to Dr. J. V. Sparks for helpful assistance and advice.

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GLOSSO-PHARYNGEAL NEURALGIA.

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It has for some years been known that it is possible for a patient to suffer from paroxysmal pain in the distribution of the glosso-pharyngeal nerve. Neuralgia of this nerve is in all respects the counterpart of the much commoner neuralgia of the trigeminus, presenting the same intermissions and remissions, the same brief excrutiating pains, the same precipitation of spasms by specific movements or contacts. The difference, clinically, between trigeminal and glosso-pharyngeal neuralgia lies purely in the territory in which the pain is experienced, on the one hand in the face, on the other in the throat and ear, but especially in the throat.

Weisenberg (1910), in the course of an excellent account of a lateral recess tumour in a man of 35, for the first time drew attention to the painful syndrome of the glosso-pharyngeal nerve.

In his case the pain was produced by the pressure of a tumour on the nerve, the irritative phenomena being as follows: "(the pains) were chiefly localised to the back of the tongue, or, as he expressed it, at the 'root,' and ran down the throat to his ear. He always complained of a burning feeling in his throat, and occasionally of sensations which he likened to the crawling of roaches or flies, of a constant dryness, and of a feeling like hot or ice-cold water. He had, besides, sharp, shooting, stinging pains, which started in the back of the right side of the tongue and ran to the right ear and down the right side of the throat and, when they were exceptionally severe, to the shoulder. These lasted only for a few minutes, were sometimes agonising, and nearly always caused him to turn his head and neck to the right. Eating, especially in the last year of his illness, would always cause him pain, and his wife does not remember a single meal that he ate during this time in which he did not have attacks of pain. He did not have difficulty in swallowing, and he never choked. The pains while eating were brought on not so much by the chewing as by the contact of the food with the posterior part of his mouth and by swallowing."

Weisenberg, in critical discussion of his own case, does not specifically state that spontaneous neuralgia might originate in the glosso-pharyngeal nerve. Wilfred Harris (1921) was the first to bring forward examples of this new clinical entity, the first, that is, if we set aside, as seems proper, three cases of pharyngeal neuralgia recorded by Sicard and Robineau (1920) on the ground that these authors were not certain whether the pain originated in glosso-pharyngeus, vagus, or cervical sympathetic. Further records appeared in the American literature, notably those by Doyle (1923), Adson (1924), Singleton (1926), Dandy (1927), and Stookey (1928). Purdon Martin's (1931) paper describing a case, and discussing generally the features of the disease, if we may so term a neuralgia, is the most recent addition.

The pain of spontaneous glosso-pharyngeal neuralgia is very similar to the secondary pain described by Weisenberg. It generally strikes into the throat, and particularly at the junction of the faucial pillars with the base of the tongue, and a "trigger zone" has been noted at this point in some cases. The pain shoots from the lateral wall of the pharynx into the ear, particularly on swallowing, and it has generally first appeared during that act.

The case to be described is, so far, unique not because the pain began in the ear (for this has been noted before), but because it remained there for over 30 years before it spread to the throat.

Case Record.

A. B., a Jew aged 70, was admitted to the Salford Royal Hospital on Oct. 20th, 1929, complaining of paroxysmal pain deep in the left ear. The history of the malady extended back over a period of 36 years, with long remissions; apart from this his health had been, and still remained, excellent.

He was accustomed to have two attacks of pain each year, but latterly it had returned with great regularity every four months. He had received great benefit from medicinal treatment, and it was only recently that the failure of a prescription which he had received in Berlin led him to seek surgical relief. The pain was paroxysmal in character, began inside the left ear, and he invariably pressed his finger into the auditory meatus in an attempt to demonstrate where the pain was. The pain did not affect the auricle, but radiated deep into the head and not into the throat; it spread a little in front of the ear, but never went forward into the lower jaw, cheek, gums, tongue, or temple. The spasms, so far as he was able to tell, were not excited by anything in particular; this was an unusual feature, for glosso-pharyngeal neuralgia is generally excited by swallowing. During the pains, which were of brief duration, he grimaced, turned his head to the left, and held his face in his hands.

In the belief that this was an example of trigeminal neuralgia of unusually limited extent, alcohol injections had already been tried, and he had six months' freedom from pain after one of these. In view of later developments this relief was probably a coincidence, but it was very misleading. The return of paroxysmal pain made it evident that something more drastic must be undertaken, and in the belief that we were dealing with an unusual trigeminal neuralgia a fractional division of the sensory root was performed under local anæsthesia, helped out by a little ether whilst the actual root was being uncovered and cut. The patient made an uninterrupted recovery, but before his discharge at the end of fourteen days there were already suspicious discomforts in the ear, of the old kind, and he seemed apprehensive. His fears were well-grounded, and three months later he was admitted with pains rather worse than before. Not having quite such firm faith then, as I have now, in the permanence of relief after fractional root section, it seemed possible that the pain might have been due to some fibres destined for the auditory meatus having escaped division, presumably owing to an anomalous grouping in the root. Accordingly, again under local anæsthesia, the wound was reopened, the root rapidly exposed, and the remaining fibres cut, and, in addition, the third division was sectioned at the foramen ovale intracranially, to allow of no possible misinterpretation of the result. This operation solved the problem, for not only did the pain in the ear return in three days, but it now appeared for the first time in the left fauces. Further, the attacks were constantly precipitated by swallowing, so that he was almost unable to drink. It was now clear that we had been deceived as to the true origin of the pain, as so many clinicians have been before us, and that the glosso-pharyngeal nerve would have to be resected if we were to cure him.

We had a choice of the posterior fossa route advised by Adson and Dandy, or a high extracranial division. In view of his age, the latter seemed to be the wiser course, though there was some risk of failure, for unless the nerve was pulled out of the jugular foramen after dissection close to the base of the skull the tympanic branch, which had caused so much trouble, would escape. Through a long incision at the anterior border of the sterno-mastoid muscle on to the mastoid process the glosso-pharyngeal nerve was sought. A free section of the fibres of the sterno-mastoid was necessary, as the man had a short, obese neck. After a very difficult dissection the glosso-pharyngeal nerve was identified high up, separated of its extracranial vagal connexions, and avulsed at the jugular foramen by strong, steady traction.

From the time of his recovery from the anæsthetic to the present day the patient has been entirely free from pain. Examined in June, 1931, fifteen months after the last operation, he declares himself to be extremely well, pain free for the first long time in 38 years, and is very active for his 71 years.

The accurate testing of sensation in the throat is extremely difficult, but the patient is quite aware of a difference between the two sides. The vagus was slightly contused during the avulsion, for he had a left side paralysis of the vocal cord and some difficulty in swallowing. This recovered slowly, but it was five months before all these additional troubles had subsided. Fortunately, this handicap impeded his recovery very little indeed. There is profound anæsthesia of the cheek and palate, and although he can recognise touch over the left fauces and tonsil he states that it is much more numb than the right side. Palatal movements are perfect.

Comment.

The glosso-pharyngeal nerve supplies the middle ear, mastoid air-cells, and Eustachian tube by means of the tympanic nerve. This leaves the petrous ganglion actually inside the jugular foramen, and does not appear outside the skull. It follows that this branch is inaccessible, and pain arising in it can only be stopped by an avulsion at the base of the skull, which will probably tear the tympanic nerve as well; or by an intracranial section of the glosso-pharyngeal trunk before the branch has been given off. The pharyngeal supply of the nerve to the tonsil, posterior pillar of the fauces, and base of the tongue can be easily secured in the neck. Hence the cervical approach to, and extracranial division of, the nerve is more fitted for those cases in which faucial pain is dominant, but, even then, avulsion rather than clean section should always be performed.

My own case, on grounds of pure logic, was better fitted for the high (intracranial) section, but I judged his age to be against it, and fortunately the operation was entirely successful.

Purdon Martin's case showed the same limitation of pain to the tympanic branch in its initial stages, but for a shorter period, before extension to the throat; this was also the case in two of Doyle's patients. Martin compared this divisional electivity to that so common in trigeminal neuralgia, and my case enables me to confirm this view absolutely.

The innervation of the ear is complicated, and there might be doubt as to whether the glosso-pharyngeal through nervus tympanicus or vagus through ramus auricularis is the real cause. Sicard and Robineau expressed that doubt by the treatment they adopted for their cases (section of the glosso-pharyngeal, pharyngeal branches of the vagus, and excision of the superior sympathetic ganglion). But the syndrome of pain in the ear and in the throat can now clearly be regarded as glosso-pharyngeal, for clean intracranial division of the nerve has cured the pain absolutely. Crises of pure vagal disturbance have not been recognised save as a parasyphilitic phenomenon. The only disturbing feature about the crispness of the picture of aural and pharyngeal pain is Temple Fay's experiences with hopeless malignant disease of the pharynx, for in one of his cases pain in the throat was not relieved by a glosso-pharyngeal section, and in another was cured by cutting the vagus, the ninth nerve remaining intact. These were in examples of hopeless malignant disease, and run counter to the general mass of experience, such as it is. In my own view it seems to be certain that the vagus is chiefly motor to the pharynx and the glosso-pharyngeal chiefly sensory, no new idea but a reaffirmation of anatomical teaching borne out by clinical experience.

One other point is worthy of comment. It has been the custom amongst surgeons to explain the pain in the ear experienced by some sufferers from carcinoma of the tongue as referred along the lingual branch of trigeminus. But anterior lingual growths rarely produce it, and it is my impression that pain deep in the ear is only felt when the growth is far back and invades the fauces. It is therefore more likely to be glosso-pharyngeal than trigeminal. Pain referred to the tragus might be trigeminal, but not pain deep in the ear. After trigeminal sections there is surprisingly little anæsthesia in the auricle, and after glosso-pharyngeal section none at all, for it supplies the deep structures only. None the less, two or three cases of glosso-pharyngeal neuralgia in the literature have had painful ears, notably one case of Harris's. Nor is there any palsy of the soft palate or pharyngeal constructors unless the vagus has been coincidentally damaged.

Treatment.

As Harris has observed, and Martin supported the view, medicinal treatment may be successful for a long time. My patient obtained relief for years by drugs. No doubt these patients may have received drug treatment longer than trigeminal neuralgics, since the individuality of the affection has only recently crystallised out. But now that its identity is established recourse will be likely to be made to surgery rather earlier. As to the choice of route, there can be no doubt that the intracranial operation is the easier, and is therefore preferable. Even in the hands of those skilled in operations on the neck, the isolation and avulsion of the glossopharyngeal is a difficult undertaking and calls for gentleness and skill. In a thick-necked patient the nerve is very high and pharyngeal branches of the vagus may be mistaken for the nerve sought (vide Adson, case 2). Further the difficulty of ensuring section of the tympanic nerve is a disadvantage. It has succeeded, none the less, in Adson's hands and in my own. Temporary impairment of vagal functions may occur whichever route is employed, but fortunately does not seem to invalidate the result. Branches pass between the ninth and tenth nerves in the jugular foramen and avulsion of the former may cause slight damage to the vagus. The intracranial operation is essentially one for the surgeon familiar with the anatomy and methods of access to the lateral recess.

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BLOOD TRANSFUSION IN TWO CASES OF AUTO-AGGLUTINATION.

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The phenomenon of auto-agglutination is not common, and transfusion in such cases is still more rare. We have not been able to trace, in the literature at our disposal, one case in which a transfusion was performed. In view of this it was thought advisable to place on record two cases which have recently come under our investigation.

In this department, although a grouped voluntary transfusion list is maintained, blood-matching is performed in every case before a transfusion is given. The serum of the recipient is matched against a red-cell saline emulsion of the proposed donor.¹ In both the following cases we found that the serum of the patient agglutinated the red cells of the donors. Some of the latter belonged to Group O (IV. Moss); there was therefore something more than the usual iso-agglutination in these cases. The blood-matchings were performed at laboratory temperature. At the suggestion of Dr. Dyke, the slides on which the matchings had been done were transferred to the incubator (temperature 37° C.), and it was found that the agglutination disappeared.

THE TWO CASES.

Case 1, a married woman, aged 32, and seven months pregnant, had not been feeling well since the beginning of pregnancy. She complained of lassitude, headache, and noises in the head. Her appetite was poor, and there had been some recent swelling of the feet. There had also been some fairly severe hæmorrhage from piles. She was extremely pale and thin. The conjunctivæ were yellowish, and there was some slight œdema of the lower limbs. The heart was not enlarged but there was a soft apical bruit. The reflexes were somewhat diminished, but the plantar responses were both flexor. The interest centred around her blood condition. On admission on Jan. 24th, 1931, her blood count was:—

Red cells..	.. 1,040,000	Polymorphs	..86 per cent.
White cells	.. 8,000	Lymphocytes..	13 ,,
Hæmoglobin	.. 18 per cent.	Monocytes	.. 1 ,,

Mean diameter of red cells approx. 8 μ. Six nucleated red cells in counting 100 white cells. Slight inequality in size of red cells.

With such a blood picture a transfusion was suggested, but it was found that the serum of the patient produced universal agglutination. The patient was herself Group B (III. Moss), and she had been tested against three donors of Group O (IV. Moss). When the slides were transferred to the incubator the clumping in all cases disappeared.

On testing the red cells of the patient against her own serum there was slight, but distinct agglutination at laboratory temperature, and intense agglutination at ice-chest temperature (4° C.). Agglutination also occurred between the patient's serum and the red cells of all other Group O (IV. Moss) individuals at 4° C., although this was slow in developing, but there was no agglutination when the matching was performed at incubator temperature. In view of the fact that the patient could not possibly agglutinate her own red cells at body temperature, a transfusion was agreed upon, her husband, Group O (IV. Moss), being used as the donor. Sixteen ounces of blood were given by the sodium citrate method, extra precautions being taken to maintain the blood at body temperature during the procedure.

The patient took the transfusion exceedingly well; there was no distress, and there was no appreciable increase in the pulse-rate. About twenty minutes later there was a sudden collapse, and the temperature rose to 104° F. She was extremely dyspnœic, but was able to tell us that she was suffering from pain and distress across her chest. Her condition gave rise to much anxiety. Tepid sponging was ordered, and morphia and adrenalin were given subcutaneously. These were followed almost immediately by cessation of all the symptoms, and there was no further period of anxiety. On the days following the transfusion there was no evidence of intravascular hæmolysis or clumping of the red cells, and no hæmoglobinuria or jaundice. The patient made a good recovery on preparations of iron. The following blood counts show the course of the convalescence:—

Jan. 27th: Red cells, 1,280,000 per c.mm.; reticulocytes, 10,800 per c.mm.
Jan. 31st: Hæmoglobin, 22 per cent.; red cells, 1,610,000; reticulocytes, 151,000.
Feb. 7th: Hb, 37 per cent.; red cells, 1,890,000; reticulocytes, 71,820.
Feb. 12th: Hb, 51 per cent.; red cells, 2,420,000; white cells, 9200; reticulocytes, 16,900.
Feb. 20th: Hb, 61 per cent.; red cells, 3,120,000; white cells, 10,300; reticulocytes, 15,600.

She was delivered of a full-time living child on

March 21st. A few days after her confinement she still showed the cold auto-agglutination of her own red cells, and also the red cells of Group O (IV. Moss) individuals.

Case 2, a girl aged 5½, was one of thrombocytopenic purpura. A petechial hæmorrhagic rash was noticed five days before admission. It had started on the face and spread downwards. Two days before admission bleeding commenced from the gums and nose, and there was also some melæna and slight hæmatemesis.

On admission the child was very anæmic, blood was oozing from the gums and nose, and there was a generalised hæmorrhagic rash. The breath smelt of acetone. In order to arrest the hæmorrhage a transfusion was suggested. On doing the routine blood-matching we found that the serum from this patient agglutinated the red cells of each donor tested. The patient herself was Group A (II. Moss). Her serum had been put up against the red cells of her father, Group A (II. Moss), her mother, Group A (II. Moss), and those of another, Group O (IV. Moss). Agglutination occurred in all cases at laboratory temperature. The matching was repeated at incubator temperature, and the clumping disappeared.

The condition of the patient was desperate, and it appeared very doubtful whether she could stand a reaction such as was experienced by the patient in Case 1. In view, however, of the fact that unless the hæmorrhage were stopped death appeared inevitable in any case, a transfusion of 8 oz. of blood was given. The donor was the Group O (IV. Moss). The transfusion was taken well. About 45 minutes afterwards the patient collapsed. The temperature rose to 105° F., there was marked dyspnœa, and the child appeared to be suffering from severe shock. After our experience with the previous case adrenalin and morphia were given immediately, and tepid sponging was done. These were followed within a short time by complete recovery and cessation of the hæmorrhage.

On the following day the child developed a bronchopneumonia, probably aspiration in type. This ran a severe course, but the chest cleared completely in 12 days, and the child was discharged fit and well some ten days afterwards.

On admission the blood picture was as follows:—

Hæmoglobin	.. 32 per cent.	Polymorphs.	..71 per cent.
Red cells	..1,520,000 per c.mm.	Lymphocytes	..22 ,,
White cells	.. 6,700 ,,	Monocytes	.. 7 ,,

No morphological abnormalities of red or white cells; platelets, 1 per 1000 red cells; total, 1520 per c.mm. A few giant platelets noticed.

The prick which had been made in the lobe of the ear for this blood count was still oozing some three hours afterwards, but all bleeding ceased at the commencement of the rigor after transfusion. Subsequent blood counts were:—

May 14th (two days after the transfusion): Hb, 24 per cent.; red cells, 1,510,000; white cells, 13,200; platelets, 15 per 1000 red cells; total, 22,650 per c.mm.

May 26th (during the pneumonia): Hb, 29 per cent.; red cells, 2,010,000; white cells, 16,200; platelets, 146 per 1000 red cells; total, 293,460 per c.mm.

June 12th (two days before discharge from hospital): Hb, 54 per cent.; red cells, 3,730,000; white cells, 10,400; mean diameter of red cells, 7 μ; platelets, 88 per 1000 red cells; total, 328,240 per c.mm.

The patient was discharged in a perfectly healthy condition. The course of the convalescence was so satisfactory that there was no necessity to consider splenectomy, which Piney calls "the one almost certain method of inducing the onset of a thrombocyte crisis."[2] The giant platelets were noticed at the first blood examination only.

In this case some relatives of the child were also tested for auto-agglutination. The father and another daughter, both of whom were Group A (II. Moss), showed no auto-agglutination in the cold, but the mother, Group A (II. Moss), showed marked auto-agglutination at ice-chest temperature; this required fully two hours to develop. When the serum of the mother was put up against the red cells of Group O (IV. Moss) agglutination occurred rapidly at laboratory and ice-chest temperatures.

COMMENT.

The object of this paper is to show that cases which manifest auto-agglutination can be transfused. The recognition of these cases is rare; possibly they are much more common than is generally believed.

At a meeting of the Pathological Section of the Royal Academy of Medicine in Ireland,[3] W. Boxwell reported a case, and J. W. Bigger reported that he had been able to trace 22 cases of true auto-agglutination. Li Chen-Pien,[4] in an excellent article, describes his observations in such a case, and also gives a review of the literature.

The agglutination is not the usual iso-agglutination, but is apparently a temperature phenomenon and does not occur at body temperature. As a rule, the lower the temperature the more intense is the clumping of red cells. In view of this fact it is essential that the blood of the donor be not allowed to cool during the transfusion. In such cases the transfusion is apparently followed, after a short interval, by a severe reaction, but the symptoms can be relieved by morphia and adrenalin.

The experimental side of these cases has not been considered, as, at the present, this part of the work is incomplete.

SUMMARY.

1. Two cases of cold auto-agglutination are here described, one of anæmia complicating pregnancy and the other a case of thrombocytopænic purpura (Werlhof's disease). 2. In both cases transfusion was essential and was performed. 3. The transfusion in each case was followed by a period of extreme distress for the patient. 4. The symptoms of this distress were relieved by morphia and adrenalin. 5. In neither case was there any evidence of intravascular lysis of the red cells. 6. A thrombocyte crisis can be induced in cases of thrombocytopænic purpura by blood transfusion. 7. Auto-agglutination may be hereditary, as it was also present in both mother and daughter, Case 2, but it is impossible to formulate general rules on one case alone. 8. This phenomenon is not a manifestation incident to anæmia, as it was present after the anæmia had disappeared. 9. Group O (IV. Moss) still remains a universal donor. 10. Blood-matchings and blood-groupings should be done at body temperature and not at laboratory temperature as hitherto.

The blood-groups are given in terms of the international classification, those of Moss in parenthesis.

We are much indebted to Dr. S. C. Dyke, director of the pathological department of the Royal Hospital, Wolverhampton, who recognised the condition in Case 1, and to Dr. J. H. Sheldon and Dr. J. N. McTurk, visiting physicians, the Royal Hospital, Wolverhampton, for permission to use the clinical notes of these cases.

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OBSERVATIONS ON A SPHERULE RECENTLY DESCRIBED IN DISSEMINATED SCLEROSIS.*

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AND

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(From the John Burford Carlill and Neurological Research Laboratories, Westminster Hospital.)

THE spherule described by Miss K. Chevassut[1] as the specific virus in disseminated sclerosis, and its employment as the basis of a vaccine in the treatment of this disease by Purves-Stewart,[2] has given rise to considerable discussion during the past two years.

Smith and Ransome[3] also observed this spherule in cases of disseminated sclerosis, but did not have the opportunity of investigating other types of disease. Carmichael[4] was unable to confirm Chevassut's findings, and a series of cerebro-spinal fluids submitted to her by him under test conditions were reported on in such a way as to cause him misgivings as to the validity of her original observations. Lépine and Mollaret,[5] of Paris, have recently published observations which still further throw grave doubts as to the spherule described by Chevassut being specific for disseminated sclerosis, since they have observed them in many other conditions. More recently still Tronconi,[6] of Pavia, confirms the findings of Lépine and Mollaret, and in addition to observing these spherules in liquid preparations has succeeded in obtaining them on agar slip-cultures.

Shortly after the original article by Miss Chevassut appeared we published the results of experiments on the biochemical and pathological effects of cultures of this spherule which were supplied to us by her.[7] In view of the experiments now to be described many of these deductions must be regarded as of little value.

As the result of a series of experiments in the nature of a repetition of the work of Chevassut, and before the publication of the work of Carmichael and Lépine, we began to have serious doubt about the specific nature of this spherule in disseminated sclerosis. This fact was made public with a promise of a fuller communication as soon as possible.[8] The present paper seeks to fulfil the promise. The preliminary experiments followed the lines laid down by Chevassut in her original paper, but the subsequent experiments were altered in the manner shortly to be described.

EXPERIMENTS.

Miss Chevassut in her first paper, and in subsequent communications, has stressed the fact that it is essential that the spinal fluid be received *direct* into the culture medium, or at the latest a very short time after. She claims that the discrepancy between her results and the diagnosis in the test series sent to her by Carmichael was due to delay in transmission of these fluids. Fluids from disseminated sclerosis were therefore investigated as follows.

One portion of each fluid was treated exactly as in the original technique, another was allowed to stand on the laboratory bench in the light for 48 hours, while a further portion was placed in the ice-box for a similar period, before being finally added to the broth and serum. It was found that whether the fluid was added direct to broth and serum, or whether allowed to stand on the bench or in the ice-box before being added to broth and serum, that on incubation these spherules appeared, the appearances being identical as regards morphology and number. It therefore does not appear that this objection of Miss Chevassut's is a valid one in the experiments carried out by Carmichael.

Stress has been laid on the necessity of using human serum, but rabbit's serum has been found to give quite as good results. Horse serum is not quite as efficient. The reaction of the broth has been stated to be of the greatest importance, and broth prepared by Hartley's formula was used in the original experiments. Ordinary tryptic broth, and even Lemco broth, gave almost equally good results, and one batch of quite roughly standardised Lemco broth seemed equally efficacious. Thus from these experiments many of the essentials laid down in the original paper seemed open to doubt. All attempts to obtain colonies on agar slip-cultures, after the technique of Welch[9] were unsuccessful both in cases of disseminated sclerosis and in all other fluids investigated, but Tronconi has succeeded in obtaining these in disseminated sclerosis and in other lesions of the nervous system.[6]

In the course of the preliminary investigations a considerable number of spinal fluids from lesions other than disseminated sclerosis were investigated, and spherules indistinguishable from those seen in disseminated sclerosis were observed.

The question of serum contaminants was not neglected, and it is admitted that these may present some difficulty; after a certain amount of experience these bodies can be differentiated from the spherules which form the subject of this paper. As a further safeguard (in the series of fluids to be subsequently described), a control tube of the same batch of serum and broth was incubated along with the serum-broth plus spinal fluid. In this way by examining drops taken from the control tube and the test mixture any appearances due to the spherule are readily appreciated. Further, it became a matter of constant observation that the controls remained quite clear to the naked eye while the positive tubes (after incubation for 24 hours to five days) presented a definitely turbid appearance. This turbidity, and therefore the appearance of the spherule, is caused, in our opinion, by the interaction of substances in the cerebro-spinal fluid and the blood-serum. Serum and broth alone do not produce this turbidity. Nor does it appear to be obtained from such cases of normal or hysterical patients that we have had the opportunity of examining. As it has not been possible to obtain a reasonable number of strictly normal fluids on which to make investigations, it would be wrong to express any definite opinion as to their constant appearance or absence in normal conditions.

It can be asserted that spherules, having apparently all the characteristics of the spherule described by Chevassut, can be observed in a large number of other abnormal conditions of the spinal fluid; and it is not possible to confirm her statement that they are specific to disseminated sclerosis. An examination of the Table shows that a positive culture can be obtained in all cases of organic nervous disease, when there is active breaking down of nervous tissue. This suggested that the spherules, granules, &c.,

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* The major portion of this paper was communicated to the Pathological Society of Great Britain and Ireland on July 3rd.

are formed as the result of breaking down of blood protein by products of cellular disintegration—i.e., enzymes.

To test this possibility, a normal, fresh brain was stripped of its meninges, the grey and white matter separated as far as possible from blood-vessels, &c., and ground up with sharp sand. The resultant mixture was filtered through fine Berkefeld filters until it was optically clear. This extract was then used in a broth and serum mixture in the place of the cerebro-spinal fluid. In 24 to 48 hours an optical appearance consisting of spherules, granules, and filaments indistinguishable from that obtained in disseminated sclerosis was seen.

TABLE OF RESULTS.

	Cases.	
Cerebral thrombosis	1	Spherules present.
„ tumour	3	Spherules present in all.
„ abscess	1	Spherules present.
Spinal curvature	1	No spherules observed after 5 days.
Disseminated sclerosis	5	Spherules present in all.
G.P.I.	4	
Tabes	1	Spherules present.
Spastic paraplegia	1	
Parkinson's Disease	1	
Subacute combined degeneration of cord	1	
Amyotrophic lateral sclerosis	1	
Paralysis agitans	1	
Epilepsy	1	
Amentia	1	
Sciatica	1	
Uræmic fits	1	
Tuberculous meningitis	2	Spherules present in one case and absent in the other.

The Table is a list of 27 cerebro-spinal fluids treated under the same conditions. The conditions were that each fluid was exposed on the bench for 48 hours before being transferred to the serum-broth mixture (Hartley's broth, pH 7·6). This mixture was then passed through a small Berkefeld filter and incubated. A control broth-serum tube was similarly passed through a filter and incubated. Examinations of control and test cultures were made at intervals of 24 hours up to five days.

Thus, out of 27 cases, in which disseminated sclerosis only accounted for five of the series, 20 conditions other than disseminated were positive for the spherule and two negative.

CONCLUSIONS.

(1) The spherule described by Chevassut is not specific to spinal fluids of disseminated sclerosis, but can be found in the fluids from many other conditions. This agrees with the published findings of Lépine, Mollaret, and Tronconi. (2) Many of the essential conditions, especially that of the need for immediate transference of the spinal fluid to the broth-serum mixture, laid down in the original paper appear to be open to considerable elasticity on further investigation. (3) We have not been able to obtain agar slip-cultures, but this has been accomplished by Tronconi in disseminated sclerosis and in other lesions of the nervous system. (4) We do not consider the spherule to be a virus, but a flocculation or precipitation phenomenon produced by the interaction of the spinal fluid and blood-serum. (5) It has not been possible to study a sufficient number of normal fluids in order to state whether this phenomenon indicates an abnormal fluid or whether it occurs with any fluid.

In conclusion, it is desired to thank the physicians of the Westminster Hospital and of the Springfield Mental Hospital, Tooting, for their assistance in supplying fluids for these investigations.

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CLINICAL AND LABORATORY NOTES

DIPHTHERIA TOXIN OF HIGH VALUE.

BY C. G. POPE, B.SC. BRISTOL,
BIOCHEMIST, WELLCOME PHYSIOLOGICAL RESEARCH LABORATORIES.

FOR a number of years we have steadily increased the strength of the diphtheria toxin produced at the Wellcome Physiological Research Laboratories, and I feel it would be of interest to place on record the details of one batch of toxin of unusually high value. Working with tryptic digest medium, we have frequently obtained toxins with an Lf. value of 40 units per c.cm.* Recently a medium prepared from horse-muscle infusion and proteose peptone, containing sodium acetate, and sterilised by filtration through a Berkefeld candle—both important points—gave toxin with an Lf. value of 50 units per c.cm. This toxin was examined at the National Institute for Medical Research by Mr. Percival Hartley, D.Sc., who obtained the following results: M.L.D., 0·00038 c.cm.; Lo., 0·022 c.cm.; L+, 0·026 c.cm. I hope shortly to publish full details of the method of preparation of this medium and of others which have been found to give high-value toxins.

I wish to express thanks to Dr. Hartley for the tests which he carried out on this toxin, and to Dr. R. G. White for information regarding the methods used for preparing diphtheria toxin at the Belmont Laboratories.

ANTITOXIN OF EXCEPTIONAL POTENCY.

BY A. T. GLENNY, B.SC. LOND.,
SEROLOGIST, WELLCOME PHYSIOLOGICAL RESEARCH LABORATORIES.

IT is of interest to other workers to place on record instances of antitoxin of exceptional potency. Among a group of 52 horses recently immunised with diphtheria toxin containing an average of 25 Lf. units per c.cm., prepared by Mr. C. G. Pope, seven produced serum containing from 2000 to 2500 units of antitoxin per c.cm., three between 2500 and 3000, and one contained 3000 units per c.cm. As this is the strongest unconcentrated antitoxin yet produced at the

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* The abbreviation Lf. is a descendant of Ehrlich's Lo = Limes null—i.e., the dose of diphtheria antitoxin which, when mixed with one test dose of toxin, and injected into a guinea-pig, will prevent the appearance of any local œdema; similarly L+ is the amount of antitoxin which just fails to prevent the death of an animal. Lf. is the amount of toxin which (f) flocculates with one unit of antitoxin when mixed in the Ramon method. —ED. L.

Wellcome Physiological Research Laboratories, we sought an independent confirmation of our test; Mr. Percival Hartley, D.Sc., kindly offered to test this serum in the Department of Biological Standards, National Institute for Medical Research, and confirmed our findings. We have also to acknowledge the kindness of Mr. P. Bruce White, of the same department, in comparing the value of two samples of *Bacillus welchii* antitoxin, one an unconcentrated serum containing 800 to 900 units per c.cm. and a concentrated sample (produced from lower value sera) with 1300 units per c.cm.

The advantage of strong toxin cannot be too greatly emphasised, not only for the production of high-value antitoxin, but also for use as test toxin. The accuracy of any test can almost invariably be increased by the use of larger test doses of toxin. The use of a test dose of diphtheria toxin equivalent to 10 or 50 units of antitoxin increases the accuracy of titration, and tetanus antitoxin can be tested with advantage at the 2 rather than at the 0·2 international unit level.

INTRAMUSCULAR INJECTIONS OF CALCIUM.

By T. Izod Bennett, F.R.C.P. Lond.,

PHYSICIAN TO OUT-PATIENTS, MIDDLESEX HOSPITAL.

The administration of calcium for the treatment of tetany has always been complicated by the tendency of calcium salts to produce necrosis on injection. This can be overcome when the intravenous route is employed, but makes the use of intramuscular injections for this purpose very difficult, if not impossible. Although in cases of acute tetany the intravenous method is the one of choice, it is not readily applicable in chronic cases.

I have recently been confronted with a severe case of chronic tetany, due to persistent steatorrhœa, which could not be controlled by the oral administration of calcium owing to defective alimentary absorption. It was, however, successfully controlled by the intramuscular injection of tetanol, a solution of calcium gluconate and lævulinate prepared by the Crookes Laboratories.

For the special purpose of this particular case, Messrs. Crookes prepared ampoules containing 5 c.cm. of a 3 per cent. solution of this substance, and these were given daily into the buttocks for a period of three weeks. These 21 injections were not attended by pain, and upon only one occasion was any local inflammatory reaction noted; the substance was rapidly absorbed, and arrest of the tetany successfully secured.

Enlargement of Isle of Wight Hospital.—Princess Beatrice recently opened extensions of this hospital at Ryde which have cost £16,000. They include a new women's surgical ward of 12 beds, an enlargement of the X ray department, and improved accommodation for nurses and the domestic staff.

Preston Infirmary.—Last year the in-patients at this institution treated to a conclusion numbered 6397, an increase of 617; there were 23,507 new out-patients, an increase of 2120. Casualties numbered 8578, and in the four theatres 6388 operations were performed. Owing to the industrial depression the Workpeople's Infirmary Fund produced nearly £3000 less, and 1930 closed with a deficit on the year of £5170. The average annual cost of a patient was £109 10*s.*, the weekly cost £2 1*s.* 8½*d.*, and the cost per patient £5 4*s.* 7½*d.*

BRITISH MEDICAL ASSOCIATION.

ANNUAL MEETING IN EASTBOURNE.

SECTION OF PATHOLOGY.

At the third session of this section on July 24th the chair was taken by Dr. R. G. Canti.

Epidemics.

Prof. **Major Greenwood** read a paper on the Factors Determining the Difference between an Epidemic of one Disease and that of Another. He pointed out that almost every word in his title alone required definition: what was a disease; what was an epidemic? Nevertheless, dialectical difficulties should not deter them from discussing a question which had interested the profession for thousands of years. According to Galen, there were three factors: the innate, temperamental and procatarctic, and the external atmospheric katastasis. In Galen's opinion it was rather the condition of those exposed to infection than the nature of the infection which determined the difference between epidemics. Sydenham, on the other hand, had enormously extended the sphere of the katastasis and popularised the doctrine of the epidemic constitution. In the year of grace 1931, epidemiologists were still wrangling about the problems of Galen and Sydenham. A via media must be chosen between the over-elaboration of the disciples of Sydenham and the over-simplification of academic bacteriologists. Experimental epidemiology was an attempt to simplify the study of general epidemiology by limiting the number of variable factors and by taking for study a herd of short-lived animals. These advantages were, of course, purchased at a heavy price, and the application of results to the human problems was analogical at two removes; there was a gap between the experimental mice and mice in general, and between mice and men. As a result it had been fairly well established that in herds of mice exposed to heavy risk of infection by *Pasteurella muriseptica* or *Bacterium aertrycke* the regular addition of healthy animals and careful exclusion of new infection would lead to the perpetuation of the disease through many generations. Though the infection might cease in small herds it would probably continue indefinitely in large herds. There was no conclusive evidence that environmental, non-specific factors modified the secular course of epidemicity in any significant way in these herds. Pre-immunisation greatly lowered mortality during the early herd life of the immunised animals, but ultimately the rates of mortality of pre-immunised and naturally immunised approximated to a level much above zero. Thus, it was unlikely that any artificially induced immunity would ever be more effective than that conferred in the ordinary course of herd life upon survivors of continuous infection. The very substantial advantage of pre-immunisation was that the survivors came into as good a position as the controls without having paid the price in high mortality, earlier on. No method so far tested would give a solid immunity—i.e., an approximation of the specific herd mortality to zero.

Prof. **W. W. C. Topley** agreed that the question set by the title could not be answered. The observation of "epidemic behaviour" over a large succession of waves might give a little information, but not much. It had been suggested—particularly by Boycott—that the study of mice in cages was not related to the facts of human disease; that mice did not bother to immunise themselves; that mankind depended much on immunisation, and that elephants would probably be found to depend on it still more. This was unfair to mice, which were amazingly good at immunisation, both against mouse typhoid and against ectromelia. There was no solid immunity to the latter disease. Prof. Greenwood had made immunisation appear of some value against virus diseases, but he and his colleagues had not achieved the protection they had expected to achieve against bacterial diseases. Herd vaccination had lengthened the expectation of life but had not conferred much protection. At a guess, the diseases which were mainly toxæmic fell very nearly into the virus group as regards immunological behaviour. Data on the frequency of second attacks of diphtheria, scarlet fever, measles, and typhoid were remarkably scanty. On the other hand, the answer to the question of whether antitoxic immunity, however-produced, was effective was probably in the affirmative. It seemed to be possible to secure good immunity against the streptococcus, but in scarlet fever the patients got tonsillitis; in puerperal fever it was possible to immunise against the toxin but not against the organism as such. The same was true of staphylococcal infections. Epidemiologists knew quite well the difference between diseases with different vectors, but it was nearly impossible to define the part played by each vector under clearly stated conditions. Prof. Topley confessed that he had absolutely no light on diet. A diet deficient in vitamins would doubtless increase the susceptibility, but the evidence was conflicting on whether a diet containing excess of vitamins would decrease it. Another unanswered question was whether this effect, if it occurred, was absolutely non-specific, or whether it favoured one sort of disease at the expense of another.

The variation in the virulence or epidemic potency of the parasite was probably a very important factor, but there was no valid evidence that it existed. Fluctuations according to virulence had been shown in the laboratory, but not under natural conditions. The existence of seasonal fluctuations was similarly doubtful. There was need of some means of measuring the relative importance of these different factors. Laboratory tests of immunity were very bad indeed, and far too much reliance was placed upon them.

Lieut.-Colonel C. A. GILL reminded the section that before 1919, when Prof. Topley had commenced his studies on mice, no progress had been made in epidemiology for 2500 years. Knowledge of the subject was at its very beginning. Moreover, epidemicity involved endemicity and ultimately the whole nature of disease. In his experience of malaria, plague, relapsing fever, and influenza, one of the most astonishing things was that, whether the disease was due to a bacterium and conveyed by an insect or whether it was conveyed by contamination in a laboratory, the epidemicity seemed to be entirely the same. Secondly, the old idea that an epidemic was due merely to some change in the specific parasite did not seem to hold water.

Dr. J. D. ROLLESTON stated that in his experience the proportion of recurrences of diphtheria under treatment remained constant at 1 per cent. He had seen only one second attack of small-pox, and second attacks were very rare in chicken-pox and typhus.

Dr. W. H. BRADLEY said that he had watched the throat flora in two waves of streptococcal tonsillitis in a school. Each wave had shown a uniform type, but the two types had differed, suggesting two definite waves produced by different serological strains. He exhibited graphs showing the tendency of a wave to stabilise itself after a while. Communities were, he suggested, saved from extermination in one epidemic by the onset of another, or, in nasopharyngeal disease, by the overgrowth of one strain by another.

The CHAIRMAN deplored the neglect of epidemiology, especially by the general practitioner. He asked what precautions should be taken on an outbreak of a disease with a high carrier and a low morbidity-rate, like meningococcal meningitis. It was impracticable to isolate all possible contacts.

Dr. W. G. BARNARD read a paper on

Infarction of the Myocardium.

This condition was, he pointed out, of general interest as the commonest cause of death in elderly persons. Knowledge of its morbid anatomy was necessary, because it might leave no visible signs in the heart and was frequently missed at autopsy. It could, however, be suspected partly from the history, and far more from the condition of the coronary arteries which were blocked. Death was not a direct result of the block. By experiment on dogs it had been found that ligature of the coronary arteries caused fibrillation of the muscle, due to interference with the neuromuscular control through the cutting-off of the blood-supply. Necrosis and a degeneration of the myocardium could only be seen if the patient survived for a considerable time. If scissors or probe were pushed down a coronary artery, it might easily be opened and a piece of atheromatous debris be removed without the operator finding the block, but if he made transverse sections he only required to know where the coronary arteries were. If the patient survived, the site of the lesion was marked by fibrous tissue, which might form a band or a series of lines and streaks which nearly always bore a deposition of clot. A certain amount of pericarditis was often found over the affected myocardium, which was nearly always in the left ventricle, where also aneurysms occasionally ruptured and caused hæmopericardium. The commonest cause of infarct in this region was atheroma of the coronary artery, with or without thrombosis. Emboli hardly ever occurred. In the rare younger cases an exactly similar condition might be due to aortitis. The orifices must always be examined carefully. Dr. Barnard showed a series of slides illustrating the post-mortem findings.

Dr. WILFRID MARSHALL read a paper on the

Spectra of Photo-electric Curves of Blood Pigments.

He said that the spectro-photometer gave accurate measurements of absorption in different parts of the spectrum and, if certain constants were maintained, would seem to be free from objections, although the curves did not represent the blood-spectrums seen by the eye. The instrument employed was a large-model constant-deviation wave-length spectrometer, with a polarisation photometer giving a triple field. Its average accuracy over the visible spectrum was about 1Å. A convenient solution of blood with well separated oxy-hæmoglobin bands showed a clear blue and, on diluting the solution, the α band was the last to go. The curve of the absorption coefficients showed the β band denser than the α; the limit of the β band towards the blue did not reach *O*, and was followed by increasing absorption as the violet was approached. This appearance was difficult to explain, but might be due to the residual yellow colour of blood solutions. Silver colloid solutions showed a similar tendency, and dilutions of electrargol were especially useful as a control. Dr. Marshall described experiments which seemed to show that a trace of methæmoglobin was normally present in the blood.

SECTION OF OBSTETRICS AND GYNÆCOLOGY.

Breech Presentation.

THE section met under the presidency of Mr. **EARDLEY HOLLAND**, and the first session was devoted to a discussion on this subject.

ANTENATAL TREATMENT.

Miss **GERTRUDE DEARNLEY** emphasised the need for prophylactic external version on account of the higher fœtal mortality in breech deliveries and the disadvantages to the mother which included exhaustion after long labour and severe lacerations of the pelvic floor. In addition, there was the need for ascertaining the relative sizes of the head and pelvis which was, of course, impossible with a breech presentation. The time of election was the thirty-fifth week, but if an anæsthetic was necessary it was better to delay version till the thirty-seventh week, in case premature labour supervened. An anæsthetic was unnecessary unless the patient was nervous or the abdominal muscles very strong. If the presenting part was engaged it was helpful to raise the foot of the bed for a short time before starting, or it might be necessary to push the presenting part out of the pelvis per vaginam. Most failures to turn were due to the neglect of this precaution. The speaker had never seen any serious complications follow external version, though in one case slight ante-partum hæmorrhage occurred in a case of breech presentation with extended legs, where a good deal of force had to be used. The hæmorrhage soon cleared up and the patient went to term. It was best to turn the fœtus so as to maintain the attitude of flexion—namely, by pushing the head down towards the pelvis and away from the back—but, if this failed, movement in the other direction should be tried, and often succeeded. If the head did not sink into the pelvis, a binder should be applied. If version failed it was better to wait for a few days, and not infrequently spontaneous version took place in the interval. If the legs were extended, the important point was whether the feet were lying close to the head. If not, there was often quite good flexion of the body and version was usually possible under anæsthesia and without risk. If the legs were fully extended there was also extension of the child's body—points shown by X ray examination—and it was unwise to attempt version since damage might be done, and there was risk of bringing down a hand or arm by the side of the head.

FŒTAL MORTALITY AND INJURIES.

Mr. **G. F. GIBBERD** emphasised the high fœtal mortality in breech cases. In "uncomplicated" and "complicated" breech cases at a number of English hospitals whose last reports he had examined, the fœtal death-rates were 26 per cent. and 43 per cent., respectively. At Guy's Hospital the fœtal death-rate in primiparæ and multiparæ was 28 per cent. and 15 per cent., respectively, in uncomplicated breech deliveries. He did not classify first pregnancy or extension of the legs as complications. Amongst complicated breech cases, including in this class such conditions as prolapse of the cord and placenta prævia, the mortality was as high as 57 per cent. and 49 per cent., respectively. The most important cause of intranatal fœtal death was intracranial hæmorrhage, which accounted for 75 per cent. Next in importance was asphyxia, following cord compression after birth of the buttocks, and this accounted for almost all the remaining 25 per cent. He thought that the risk of drowning from premature respiration had been much overrated, and that a hot towel over the body during birth was useless. Injuries to the limbs were nearly always the result of bringing down extended arms which might cause either fracture of the humerus or an Erb's paralysis. The latter should be treated by putting the arm into the Israelite position, and allowing active movements daily when the splint was removed for bathing purposes. A fracture of the humerus was best treated by a straight Thomas's splint with elastic extension. Within a week or ten days firm union had taken place and the splint could be discarded.

MANAGEMENT OF BREECH LABOUR.

Mr. **ALECK BOURNE** said that at Queen Charlotte's Hospital the fœtal mortality in breech labour was 11 per cent. in primiparæ and 8 per cent. in multiparæ. One of the commonest causes of obstruction in breech cases was extension of the legs, and he believed that in every case in which this complication was present, if the child were of average or large size, one foot at least, and often two, depending on the size of the baby, should be brought down as a prophylactic measure as soon as the os was sufficiently dilated to admit a hand. Having brought down the legs, they should be folded as far as possible in the normal position by the buttocks, in order to get wider dilatation of the cervix. It was of great importance, however, to refrain from pulling at this stage. He thought that the most serious complication in breech cases was extension of the arms, because of the difficulty often experienced in flexing them and of the necessity for haste. Everything should be done to avoid extension of the arms, and the cases fell into two groups. In the first, the extension was "primary"—that is, the arms were extended when the legs were extended as a fœtal attitude before labour began. Over this group we had no control. "Secondary" extension was produced during labour entirely by pulling on the fœtus, and before the elbows could be reached and hooked out from the perineum. An incompletely dilated os predisposed to this, and it was for this reason that he advised folding the feet in the normal position by the buttocks. In that position they formed a larger mass than the breech alone, with both legs either extended or brought down, and, hence, caused better dilatation. In bringing down extended arms, he had found it useful to use a manœuvre of Potter's—viz., to press the lower angle of the scapula inwards. This brought the humerus downwards within reach of the fingers. In dealing with the aftercoming head the commonest mistake was to deliver it too quickly, especially if the head was not well flexed, the sudden moulding commonly leading to intracranial injury. The inspiratory movements of the fœtus at this stage were of little importance and were no indication for unduly hastening the birth of the head. The commonest cause of difficulty with the head was incomplete flexion, and this was especially liable to occur if the legs and arms had been extended, or if there were slight flattening of the pelvis. To obviate it, firm pressure should be made on the fundus during delivery of the body, combined with jaw traction with the index finger in the mouth, the body lying astride the forearm and the first and second fingers placed over the shoulders on either side of the neck. Before any traction was made on the shoulders the head should be flexed by gentle traction on the lower jaw and simultaneous firm pressure on the fundus. He had no experience of the use of forceps on the head.

Prof. **F. J. BROWNE** thought that version in breech cases was not always a safe operation for the fœtus, There was a risk, if much force were used, of premature separation of the placenta, or the cord might become entangled around the limbs, while alarming slowing of the fœtal heart after version, probably due to shock, was a well-known phenomenon. He had seen two cases of face presentation follow version, and he thought this might easily be produced if the fœtus were turned so as to cause extension. He disagreed with Mr. Bourne as to the advisability of bringing down a foot as a prophylactic measure when the legs were extended, preferring to interfere only if and when need arose, because of the necessity for getting the fullest possible dilatation of the cervix and vagina in order to obviate, as far as possible, difficulty from extended arms or the after-coming head. In his opinion, these, and not extension of the legs, were by far the most serious difficulties in breech cases. He strongly advocated the application of forceps to the after-coming head if moderate jaw-and-shoulder traction failed to deliver.

Mr. **Donald Roy** said that in the absence of large size of the child, a small pelvis, or uterine inertia, extension of the legs was not a frequentcause of still-*birth; much more important was extension of the* arms and head. To bring down the legs was no remedy for this, and might, in fact, by allowing the breech to slip quickly out with soft parts unstretched, increase the difficulty. If external version failed when the arms and legs were extended, and if there was anything to suggest from the appearance or history that the child was large, induction slightly before term was advantageous. In any case, where the child was large, the pelvis small, or inertia present, and especially if the legs were extended, one leg should be brought down early in the second stage, and right down as an excitant of good pains. Extension of the arms should be anticipated in such cases, and the arms in all cases felt for after the umbilicus was born. If not flexed, they should be brought down without delay, after which delivery of the head might have to be hastened by careful jaw-and-shoulder traction, assisted by efficient suprapubic pressure. Respectable results in breech delivery could now be obtained by labour in such cases taking place where people experienced in breech delivery were always available. This was difficult outside institutions or maternity homes staffed by efficient midwives. Mr. Roy quoted figures relating to 107 cases treated at the General Lying-in Hospital, York-road. There were 46 primigravidæ and 61 multiparæ, and the stillbirth and neonatal death-rate was 6·5 per cent. in the former and 8·2 per cent. in the latter.

Dr. **Chalmers Fahmy** said that at Edinburgh Royal Maternity Hospital the fœtal mortality was 22 per cent. and 21 per cent. in primiparæ and multiparæ, respectively. This mortality was very high, but it must be remembered that the cases were mainly delivered by somewhat inexperienced house surgeons. It would be interesting to know the fœtal mortality in 1000 cases delivered by practitioners of several years' experience. Extension of the legs was not in itself a serious cause of fœtal death. Delay in the arms and the head was the main cause. He did not think it wise to pull down extended legs as advocated by Mr. Bourne, *believing it better to interfere only* when necessary. In bringing down extended arms it was most important to wait till the axilla was almost in view; to attempt to release the arms earlier caused difficulty and increased the risk to the child. Fundal pressure should always be gentle. It could never flex an extended head; this could only be done by the finger in the mouth. Strong fundal pressure might cause intracranial hæmorrhage, and only jammed the extended head, as a whole, into the brim.

Dr. **W. H. F. Oxley** quoted statistics to show that only about half of all breech presentations occurring in pregnancy were turned, and that attempts at version chiefly failed in the cases with extended legs. The difficult cases, therefore, still remained, and obstetricians were getting only half the experience in breech deliveries that they obtained before prophylactic version was introduced. He thought that better results, on the whole, would be obtained if we directed our attention to improving our skill in extraction, and left all cases unturned in order to provide more material for teaching and practice. He described in detail the method used in breech delivery at the East End Maternity Hospital. A team of three was necessary—midwife, obstetrician, and anæsthetist. When the os was fully dilated he ironed out the vagina and extracted the fœtus very much in the manner advocated by Potter.

Mr. **Eric Stacey** advocated the introduction of speculum to hold back the posterior vaginal wal The vagina was then swabbed out, and the fœtus thu allowed to breathe or even cry. One could then effec delivery at leisure. He thought Cæsarean sectic was justified in elderly primiparæ if the legs we extended.

Prof. **J. B. Dawson** emphasised the need f external cephalic version in multiparæ, even previous labour had been easy, on account of th tendency for the children's weight to increase i suceeding pregnancies.

Dr. **J. C. Moir** thought that anæsthetics for versic were dangerous, especially if too deep or given by a unskilled person, and that ether was more dangero than chloroform. He disagreed with Mr. Bourne to the reason why extended legs caused difficulty an delay in labour. It was not, as held by Mr. Bourn owing to the greater cross section of the fœtus whe the legs were extended, but because the lower limb formed rigid bars which could not bend laterally, an so get round the curve of the pelvic canal.

The **President** said that the acid test of a goo obstetrician was the way in which he conducted breech delivery. Every hospital should have a senio resident medical officer, who could look after th delivery of difficult cases at any hour. All case should be delivered on the back, and episiotom should always be done if any difficulty were expecte If this were done no breech case should be lost, fo it was the compression by the vulval ring that s frequently caused intracranial damage. He totall disagreed with Mr. Bourne on the question of bringin down a foot as a prophylactic measure. Bringin down an arm was a difficult procedure that involve six or seven different movements, in which a doctors should be thoroughly skilled. He believe that external version should be done in every cas in which it was possible.

Distress Warrant against a Hospital.—A Newcastle-on-Tyne Moot Hall police-court recently th Newburn rating authority applied for a distress warrar against the Newburn and District Cottage Hospital (14 bed for arrears of rates amounting to £31 3*s.* 4*d.* Mr. E Redhead, the secretary of the hospital, explained that whe the Newburn Steel Works closed down last year the hospita lost 1500 weekly subscriptions of 1½*d.* each from workmer and that the assessment had been increased from £8 10*s.* t £40. The house surgeon had been working for a long tim without pay, and the hospital had kept going only by th exercise of drastic economy. The bench issued the warrant which is, however, to be withheld, the hospital agreeing t pay £10 down and £2 per month.

REVIEWS AND NOTICES OF BOOKS

The Practical Treatment of Diabetes.

By T. IZOD BENNETT, M.D., F.R.C.P. Lond., Physician with charge of Out-patients, Middlesex Hospital, Physician to the Royal National Orthopædic Hospital, formerly Beit Memorial Research Fellow. London: Constable and Co., Ltd. 1931. Pp. 107. 6*s*.

Dr. Izod Bennett has written a small book which will be very useful both to the general practitioner, who is faced with the charge of a patient suffering from diabetes, and also to the patient. The doctor can use other and bigger books if he wants to, but the choice of a suitable book for the patient is a difficult one; the medical details necessary for the doctor are apt to frighten a patient.

The necessary information about the amount of sugar in the blood and urine is given in a simple manner, under the title of diagnosis; most of the rest of the book is devoted to the details of the treatment with and without insulin. Dr. Bennett thinks that the initial treatment should always be started with a fast day, and the diet rapidly increased up to the suitable amount. If the glycosuria persists, or the blood-sugar remains too high, insulin should be used. The rules for its administration are clearly set out, and the technique of the injection is faultless. The description of complications requiring operation, and of the effect of pregnancy, are very clear. The amount of food recommended for the average patient is 85 C., 110 P., and 110 F., and the question is discussed whether the diet should be changed to one containing 100 or more grammes of carbohydrate, with proportionate reduction in the amount of fat. Useful diet tables are given on the 5-gramme basis.

Recent Advances in the Study of the Psychoneuroses.

By MILLAIS CULPIN, M.D. Lond., F.R.C.S. Eng. Lecturer in Psychoneuroses at the London Hospital Medical College. London: J. and A. Churchill. 1931. Pp. 348. 12*s*. 6*d*.

THE "Recent Advances" series is well known and justifiably appreciated, but a volume on the psychoneuroses presents peculiar difficulties and cannot be brought completely into line. The author felt that the subject was so vague and beset with such prejudices that his book is more a review of the whole development of psychotherapy than a simple and straightforward account of recent contributions to an accepted department of medicine. He has, however, tackled his difficult task courageously, and with a considerable measure of success. After a brief historical outline, he discusses at some length the psychoneuroses of the war, from the experience of which his own interest in psychotherapy, like that of the great majority of workers in all countries, was derived. He then surveys the present position of psycho-analysis in a chapter which will be of interest to the novice, but which is not likely to satisfy the psycho-analyst, as it confines itself to elementary principles. Possibly the author regards the recent work of this school as too technical for the book as he planned it.

Succeeding chapters deal with various theories of memory, the conditioned reflex, and physical concomitants of emotion, and a good deal is said about asthma. The differential diagnosis of the anxiety, hysterical, and obsessional states is dealt with fully and clearly. Dr. Millais Culpin is exceptionally well at home in the chapters on occupational neuroses and the psychoneuroses of industry, and these two chapters constitute an excellent review of modern work in this important branch. But the chapter on the analytical psychology of Jung, written by Dr. James C. Young, seems out of place. It is an interesting expression of personal opinion, but it fails to set out the contribution which Jung makes to clinical psychotherapy and the important respects in which his technique and approach differ from those of the Freudian or Adlerian schools. It is in strong contrast to the accompanying chapter on individual psychology by Dr. A. R. Redfern, which sets forth very distinctly the point of view and method of Adler. The two remaining chapters are also by independent authors: Dr. Emanuel Miller discusses the psychopathology of childhood in a interesting and well-informed essay, with a valuable bibliography, and Dr. J. R. Rees gives a very useful guide to the establishment and maintenance of the psychotherapeutic clinic.

This volume, if it does not give a complete account of the recent progress of psychotherapy, at least records many important advances, and presents the general practitioner—for whom the series is especially designed—with a good introduction to this most troublesome subject.

Pratique médico-chirurgicale.

Third edition. Published under the direction of A. COUVELAIRE, A. LEMIERRE, and CH. LENORMANT. Paris: Masson et Cie. Tomes i. to iv. 2 vols., Fr.300; complete work, 8 vols., Fr.1200. Pp. 8500 approx.

WE have now received the first four volumes of the third and much-altered edition of this French handbook of the Practice of Medicine and Surgery. The first two editions were published under different editors in 1907 and 1911, and the present work is almost entirely a new undertaking. When completed it will consist of eight large volumes in attractive binding, containing articles collected for the special purpose from some 200 collaborators. The object of the publication has been to provide a complete account of the practice of medicine and surgery in all their branches for the use of practitioners and students, with particular regard to clinical methods and treatment, and to enable the doctor rapidly to obtain practical information on diagnosis and treatment, with little attention to theoretical or hypothetical problems. For this purpose the subject matter is arranged alphabetically under the various headings of diseases, forms of treatment, drugs, and the like. The whole work has been written and printed in the course of a year, so that articles are strictly contemporary. Many well-known names figure among the list of collaborators, and the whole is in fact a remarkable exposition of the present-day practical French teaching.

The arrangement of subjects in alphabetical order carries certain disadvantages, and an encyclopædia of medicine is by no means the most suitable type of text-book for the student. On the other hand, if the titles are well chosen this arrangement enables the practitioner to find the information he requires quickly and easily. In these volumes the subjects have strange bedfellows. Successive articles in one group concern imbecility, immunity, impetigo, impotence, and in another anxiety, aortitis, aperitive, aphasia. Headings thus include diseases, symptoms, drugs, operative and other treatments, as well as more general matters such as auscultation, hygiene, epidemiology, and the like. Important subjects such as jaundice, diabetes, and arthritis are fully and clearly treated, and the notes under the names of drugs are excellent. Some of the numerous diagrams and pictures look rather old-fashioned. Some random attempts to test the completeness of the work failed to reveal any serious omissions. English readers will find much that is new to them in this work, which is a valuable book of reference to French medical practice.

Materia Medica.

Pharmacy, Pharmacology, and Therapeutics. Twentieth edition. By WILLIAM HALE-WHITE, K.B.E., M.D., LL.D., Consulting Physician to Guy's Hospital. Revised by A. H. DOUTHWAITE, M.D., F.R.C.P., Assistant Physician to Guy's Hospital. London: J. and A. Churchill. 1931. Pp. 712. 10*s.* 6*d.*

THERE must be few, if any, members of the medical profession in this country who have not heard of Hale-White's "Materia Medica." First published in 1892, it achieved a success so remarkable that from 1897 to 1905 a new edition was brought out each year. Since then fresh editions have appeared at frequent intervals, and the task of revision has now been handed over to Dr. Douthwaite. No alteration has been made in the characteristic features of the volume, which gives a full account of the preparations, action, and uses of all the official and many of the non-official drugs. It has been brought up to date by the introduction of drugs, such as ephedrine, avertin, and parathormone, which have come into favour during the last few years. A more detailed account of these might, with advantage, have been given, even if it entailed shortening the discussion of a number of others of less importance. There are a few curious errors in spelling—e.g., Novasurol is consistently spelled with two "r's," and Yohimbine with two "e's." We anticipate that the new edition will be as successful as those in the past.

International Clinics.

Volume IV. Fortieth Series. London: J. B. Lippincott Company. Pp. 309. 12*s.* 6*d.*

THE fourth volume of the Fortieth Series of International Clinics maintains a high level of interest. Three of the clinical papers come from France, one on the treatment of boils and carbuncles by injections of oxygen, another on the importance of the nervous system in the defence of the body against disease, and a third on rheumatism of dental origin. The staff of the pædiatric department of the Fifth Avenue Hospital of New York City present contributions on child health, on the treatment of weak feet in children, on procedures in the prevention and correction of oral deformities in children, and on a comparative study of posture in the first and second decade of life. The general staff of the same hospital have clinical contributions on the care of patients in the terminal stages of cancer, on toxin-antitoxin immunisation for diphtheria in adults, postpartum fever, and allergic purpura, while there are papers by other authors on hereditary epistaxis, on the differential diagnosis of peptic ulcer, and on subacute recurrent duodenitis. Among the most interesting features of this volume are reprints of some post-graduate lectures arranged by the Medical Society of New Jersey. Prof. J. E. Talley, of Philadelphia, deals with the treatment of cardiac diseases; Dr. T. Fitzhugh, Jr., of the same city, gives a review of modern advances in diseases of the blood; and Dr. Harry Gold, of Cornell, considers some of the larger problems of drug therapy. Dr. Gold points out that one of the stumbling blocks to the successful use of drugs is the question of dosage. The physician tends to think of the dosage of a drug in terms of weight or measure rather than in terms of activity or the effects it is likely to produce, with the result that often too small amounts are administered. As a general rule, in his view, no patient should be regarded as having been adequately treated with a drug unless the full therapeutic effects have been obtained, or minor toxic symptoms produced. There can be no question but that this is a sound general principle in therapeutics, though it requires some qualification, for there are many drugs which in toxic doses are definitely dangerous and, moreover, delayed effects may have to be reckoned with. At the same time the dangers can be reduced to a minimum if the physician has a working familiarity with the earliest signs and symptoms of toxic action and therapeutic effect. This is, in fact, though Dr. Gold does not state it explicitly, a strong argument for more attention being paid to the clinical aspect of pharmacology in the training of the student.

Wilhelm Conrad Röntgen

und die Geschichte der Röntgenstrahlen. By Dr. OTTO GLASSER, Cleveland Clinic Foundation. Berlin: Julius Springer. 1931. Pp. 337. R.M. 29.60.

Dr. Glasser has performed a task which is particularly opportune at this time, when we are removed from the glamour of the early days of radiology, and are yet, fortunately, still in touch with many who took part in, and can remember, its inauguration. The author has spared no pains in collecting information about the discoverer of X rays and his work, and he includes lighter touches in the form of contemporary cartoons and advertisements in the public press. It is a story full of romance. So many stopped on the threshold of discovery, notably Crookes, in 1879, and other workers who were using Crookes and Lenard tubes in the years immediately preceding 1895. All this is set out by Dr. Glasser fairly and fully.

It is remarkable to look back on this early history, and to see how large a part of the subject, as we know it, was covered within the first year of the discovery. There is, for instance, a reproduction in the book of cinematographic pictures of the frog's leg made by Dr. James MacIntyre, of Glasgow, and published in the *Archives of Skiagraphy* for 1897. Now almost forgotten is the metal X ray tube made in March, 1896, which lies in the collection of the British Institute of Radiology at the South Kensington Museum. In these days of elaborate apparatus, it is interesting to be reminded of such an advertisement as: "Set of superior X ray apparatus, as used at the Leeds General Infirmary, &c., complete sets, including 2½ inch coil, battery, and focus tubes, from £7 10*s.* 0*d.*"

The volume has interest for every worker, whether on the medical or the physical side of radiology. Although the author is resident in America, the book is written in German, and we hope that it will be made more accessible to English readers.

THE LANCET.

LONDON: SATURDAY, AUGUST 22, 1931.

THE NUTRITIONAL ANÆMIAS.

THE historian of internal medicine will probably consider that the most important advance of this decade was the clear recognition of the nutritional anæmias. Discoveries such as the isolation of insulin have led to the successful treatment of specific diseases, but the candle lit by G. R. MINOT and W. P. MURPHY's work on liver in pernicious anæmia has thrown light on many different forms of obscure ill-health which arise from nutritional causes and have anæmia as an outstanding feature. In a paper on Simple Achlorhydric Anæmia at the front of this issue, Dr. D. T. DAVIES calls attention to the group of cases described by KNUD FABER, in Denmark, by MILLS, WATKINS, and others in the United States, and particularly by L. J. WITTS,[1] in Great Britain. To WITTS's 50 cases Dr. DAVIES adds a similar group. The patient, usually a woman, suffers as a rule for years from indigestion and a progressive anæmia, characterised by marked reduction of hæmoglobin, but with little change in the red cell count. Achlorhydria is ordinarily present, but pepsin does not disappear from the gastric juice, and secretion of hydrochloric acid can often be demonstrated after injections of histamine. Treatment with large doses of the scale preparations of iron is usually very satisfactory.

The distinction between this type of anæmia and pernicious anæmia of the true Addisonian type is definite; the simple anæmia is almost confined to women, is insidious in its onset, taking many years to develop, is always marked by prolonged dyspepsia, is associated with a much reduced intake of food both as regards quantity and variety, produces a blood-picture essentially secondary in type, and responds quickly to administration of iron. Addisonian anæmia, on the other hand, is fairly rapid in its onset, affects both sexes, is often not associated with gastro-intestinal symptoms, is always accompanied by complete achylia gastrica, produces a blood-picture which is hæmolytic in type with macrocytes and marked reduction of the red cell count, and is not curable by the administration of iron. In spite of these contrasts there is, nevertheless, an aspect of close similarity between the two diseases in that both are associated with a reduction in gastric secretion and both may be considered as largely nutritional in origin. The work of W. B. CASTLE,[2] who showed that food subjected to the influence of normal gastric juice could produce striking amelioration in the symptoms of pernicious anæmia, has led to the introduction of extracts of gastric mucous membrane, whose beneficial effects have been almost as great as those of liver. It is believed that normal gastric juice can elaborate from protein of animal origin a substance which promotes normal blood regeneration; its exact composition is at present unknown, but it is neither hydrochloric acid, pepsin, nor any other recognised constituent of gastric juice. The school of thought which always laid stress on achlorhydria as the one constant finding in pernicious anæmia was formerly of opinion that the importance of the gastric change lay in the fact that it permitted bacteria to pass unchecked direct into the small intestine, but the more modern trend of reasoning is that achylia in pernicious anæmia connotes the absence of an essential but unknown chemical constituent of the gastric juice secretion. In simple achlorhydric anæmia, on the other hand, it is believed that prolonged dyspepsia with an ill-chosen diet, either as cause or effect, can, especially if hypochlorhydria be present, lead to such a defective assimilation of iron that the deficiency has direct and damaging results.

But the conception of nutritional anæmia extends far beyond these two diseases. The severe anæmia not infrequently seen after partial gastrectomy, or after the onset of chronic gastritis following gastro-enterostomy, has been described by G. GORDON-TAYLOR and others, and without providing a condemnation of gastric surgery, such observations serve as a warning against unnecessary reduction of gastric function. In this connexion it must not be forgotten that the pyloric mechanism is in itself a safeguard which tends to secure adequate nutrition. In all cases of achlorhydria without pyloric obstruction, the emptying time of the stomach is greatly accelerated, and the same effect tends to be produced when gastro-enterostomy or gastrectomy are performed; the result of this is not only that the food is under the influence of gastric juice for a much shorter time, but also that it reaches the small intestine too rapidly and in amounts too great for the digestive powers of that most important section of the alimentary canal. The effect is often apparent in the form of loss of fat in the fæces, and gas distention of the ileum and colon due to the hydrolysis of starch by microbic action instead of by the diastatic ferments of the succus entericus. Another form of nutritional anæmia is to be found in tropical sprue where, whatever the ultimate pathology may prove to be, the essential feature is failure of absorption by the alimentary canal. The result is that not only is fat prevented from reaching the blood stream in adequate quantities, but other essential substances, such as iron, calcium, and vitamins, are insufficiently absorbed, and a striking anæmia is one of the consequences. The Plummer-Vinson syndrome, in which dysphagia is added to the symptoms commonly seen in severe achlorhydric anæmia, is yet another instance of a disease in which malnutrition plays a major part, for it has been shown that even if the dysphagia is not the primary cause

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[1] Guy's Hosp. Rep., 1930, lxxx., 253.

[2] Amer. Jour. Med. Sci., 1929, clxxviii., 748.

ANNOTATIONS

DRUGS AND THE PRACTITIONER.

In a course of lectures delivered to graduate students in New Jersey (and reviewed on p. 408) Dr. Harry Gold shows how easy it is, in the evaluation of therapeutic agents, to be led into serious blunders by inadequate experiments, insufficient controls, or unsuspected sources of error. A common mistake is to focus attention too closely on a single effect produced by a drug, without realising the numerous combinations of action which might give rise to it. The guanidine derivative, synthalin, for example, reduces the blood-sugar after oral administration, and was therefore employed and recommended in the treatment of diabetes. But a clearer understanding of its action showed that the effect is due to an injury of the parenchyma of the liver and not to an increased capacity of the body to burn sugar. The truth is that new drugs become widely used clinically before accurate knowledge of their action is available, and continue to be used blindly long after the truth is discovered. Dr. Gold utilises facts like these to drive home to the clinician in the U.S.A. the advantages of confining his therapeutic armamentarium in the main to the non-proprietary drugs listed in the book called "Useful Drugs," published by the Council on Pharmacy and Chemistry of the American Medical Association. For those wishing to give proprietary substances a clinical trial, he suggests they should confine themselves to drugs which are listed in the book entitled "New and Non-Official Remedies," published by the same Council. This work is well known in this country as well as in the U.S.A., but for those to whom it is unfamiliar Dr. Gold explains its scope. He says:

> "If a new drug is not described there or is found in the list of preparations considered but rejected, one can rest assured that the claims made for that preparation have not been substantiated by evidence that can be considered satisfactory to authorities of that subject. There are some exceptions in which preparations are rejected because they fail in other respects to comply with the rules of the Council of the American Medical Association. When a new preparation is submitted, the Council makes a careful analysis of the evidence presented to support the claims. The character of the investigation varies with the nature of the product and the claims that are made. In many cases chemical analyses are performed and pharmacological and clinical studies carried out by disinterested workers under the auspices of the Council for the purpose of checking the evidence. In most instances," says Dr. Gold, "it becomes necessary for the manufacturer to reduce his claims to conform with the results of these additional investigations, the findings of which are usually far less optimistic than the original claims."

The Council on Pharmacy, it seems, goes a little further than our newly appointed Therapeutic Trials Committee, which proposes to examine new products only on the application of commercial firms. No attempt however is made by the Council to dictate to the doctor what he is to use in his practice. The products accepted are not even recommended. All that is attempted is to aid the physician in doing what he is trying to do himself, but without adequate facilities—namely, to separate the great mass of unofficial medicines into two distinct groups, those with valid claims and those with claims which cannot be substantiated. There is, for example, no class of drugs in which it is more difficult for him to get at the truth than in the case of the barbituric acid hypnotics. It is about 30 years ago since veronal was introduced into practice, to be followed in the intervening years by a whole series of other derivatives of barbituric acid. The claims usually made for these hypnotics are that they are more effective therapeutically, and that they are safer than veronal. Yet, according to Dr. Gold, if these are tested by the "blind test," so as to exclude the influence of subjective factors, it appears fairly certain that the therapeutic and the toxic actions of the various members of this group run essentially parallel, and that whenever the chemical structure of barbituric acid has been changed so as to increase the hypnotic action, the intensity of the toxic action has been increased to practically the same degree. It follows therefore that if the various members of this group of drugs are given in doses comparable in terms of their relative potency, they have approximately the same safety and the same therapeutic efficiency. Nevertheless there remains more in the philosophy of therapeutics than is dreamt of in the most accurately compiled list of preparations whose potency is proven to the satisfaction of any school of pharmacology.

RECENT WORK ON EPILEPSY.

Epilepsy may or may not be a metabolic dyscrasia, as J. S. Collier has asserted, but its course can undoubtedly be influenced by metabolic factors. By starvation, by ketosis, or by dehydration epileptic fits may often be greatly reduced in number, and sometimes completely arrested. N. P. Walker and G. A. Wheeler[1] now claim a similar result from yet another metabolic manœuvre—namely, elimination of the pellagra-preventive factor from the diet. This was suggested by symptoms of pellagra in a patient on the ketogenic diet, the appearance of such symptoms being accompanied by a marked decrease in the number of fits. Ten chronic epileptics, all with considerable mental deterioration, were placed on a diet well balanced in all respects except that the pellagra-preventive factors were absent, or only present in very small quantities. After a varying period, averaging about four months, stomatitis and typical skin eruptions appeared. When the symptoms became severe, treatment by yeast was instituted, and readily caused their disappearance. Fit records show that about the time the pellagra symptoms appeared there was, in most of the cases, reduction of about 50 per cent. in the number of attacks. The reason for the reduction must at present be a matter for conjecture, but the observation may prove another useful piece of ammunition for those who are seeking to attack epilepsy on its metabolic side. For obvious reasons, the method is not suitable for ordinary practice.

The theory that epilepsy is often the result of accumulations of cerebro-spinal fluid, whose drainage is impeded by pathological processes in the Pacchionian bodies, we owe to Temple Fay. Much of his work is based on encephalographic studies. Other observers, however, have taken encephalograms of epileptics with less consistent results, and in the absence of a series of encephalograms of normal people, there is no substantial agreement as to what constitutes a normal picture. J. Notkin,[2] after studying 17 female patients who were suffering from idiopathic (cryptogenic) epilepsy, claims that a dilated ventricle and a large accumulation of air in the subarachnoid spaces must be regarded as pathological. In his method all the fluid that could readily be drained off by lumbar puncture was removed and replaced by air; the amount varied from 75 to 155 c.cm. After this an X ray appearance that he considered normal was obtained in eight cases; and in these most of the air had disappeared within 24 hours. In four cases there was pronounced dilatation of the ventricles and subarachnoid spaces, especially in the region of the Pacchionian bodies, and repeated pictures showed persistence of the air, in one case up to 216 hours later—a phenomenon which Notkin is inclined to associate with the ventricle dilatation. In the five remaining cases there was evidence of other pathological changes, such as asymmetry of the ventricles or leptomeningitic adhesions, pointing to inflammatory, or possibly neoplastic, processes, which were apparently not active. It is probable that further study along these lines would lead to results of high value; and this indeed is indicated in the consequent successful therapy claimed by Temple Fay. But a procedure such that no one has so far attempted to apply it to a series of healthy people should be approached with caution. Notkin is careful to inform us that none of the patients died as a consequence of the procedure; but one died five weeks later from a severe convulsion, and another eight weeks later from an unexplained hæmoptysis. All the patients had severe headaches for 48 hours after the operation, together with rigidity of the neck, profuse perspiration, vomiting, and tachycardia, which subsequently gave place to a pronounced slowing of the pulse. He is inclined to think that some of these symptoms might be obviated if the volume of air introduced were rather less than that of the fluid withdrawn.

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[1] U.S. Public Health Rep., 1931, xlvi., 851.

[2] Arch. Neur. and Psychiat., July, 1931.

INFANT DEATHS AND VITAMIN STARVATION

THE North Kensington Medical Society has circulated among its members an analysis of the causes of the 180 deaths of infants under one year which occurred in the borough during the year 1928. The report is the work of three practitioners, Dr. H. E. Barrett, Dr. A. Keith Gibson, and Dr. Eleanor M. Reece, and their conclusions are worthy of close scrutiny, as they differ appreciably from those usually reached in an inquiry of this kind. In each case investigated an attempt was made to classify the various environmental factors as "good," "fair," or "bad," these factors including housing, income, antenatal and postnatal maternal employment, feeding, maternal care, foster care, size of family, and the proximity of open spaces. In nearly 40 per cent. of the cases the family income was unsatisfactory, and an analysis of other factors in the group, taken as a whole, showed that environment deteriorated in direct proportion to the decrease of family income. In homes where the income was small, therefore, they assume that death was probably the result of several unsuitable environmental factors, or, in other words, that poverty was the real cause behind a number of these deaths. It was found, however, that bronchitis and broncho-pneumonia were *no* respecters either of houses or incomes. Among the children between six months and a year in age who died as a result of these respiratory diseases it was found that a large proportion had shown signs of rickets. The incidence of breast-feeding in this group, however, was high; out of 55 deaths from respiratory infections 30 infants were completely and 18 partially breast-fed. The investigators point out that those foods which contain vitamin D also contain vitamin A, and that a child who is showing signs of rickets must therefore be receiving a diet deficient in both these vitamins. Recent experiments on the resistance conferred against infection by vitamin A lead them to conclude that a deficiency of this vitamin would be sufficient to account for the occurrence of broncho-pneumonia associated with rickets in children between 6 and 12 months old. Even during the period from the second to the sixth month they consider a deficient diet may be responsible for deaths from respiratory infections, and claim that great improvement has been seen in cases of bronchitis and broncho-pneumonia when vitamin preparations have been administered along with the ordinary remedies. Deaths under one month from these conditions may be due, they suggest, to an innate tendency to infection, due to faulty diet and environment of the mother during pregnancy. Anticipating that the high proportion of breast-feeding in this group may be quoted as an argument against their theory, the investigators point out that it is now well established that the quality of breast milk and its vitamin content depend on the food of the mother; any deficiency in her diet will be reflected in the diet of the infant. It is admittedly by no means rare to find well-established rickets in a breast-fed infant. They make the bold suggestion that in many cases a good brand of dried milk may be better for the infant than breast milk of the quality it is receiving. Inquiry into deaths due to causes other than respiratory disease seemed to show that most of the marasmus and some of the enteritis and prematurity cases occurred where the environment was bad, and that often the parents of those infants appeared to be of poor stock, with little physical or mental ability. The investigators suggest a series of simple experiments on infant and maternal feeding which might be carried out at welfare centres, to decide how far the customary diet of pregnant and nursing women is complete in those materials essential to the child.

FRIEDMANN'S TURTLE VACCINE.

EVER since its first appearance in Germany the Friedmann turtle tubercle vaccine[1] has been a trial to the serious worker in the immunological field. It has produced a large mass of clinical records, called forth at least one government report, stimulated the appearance of a competing vaccine made from a rival strain (the Piorkowsky bacillus), and finally produced a lawsuit. But in spite of all this publicity, inquiries into the purely biological properties of the bacillus have never been as thorough as they might have been. M. A. Saenz[2] has at last removed this reproach by making—we hope once and for all—a detailed investigation. The organism was first isolated by Friedmann in 1903 from the lungs of two sea-turtles captured off Italy and removed to the Berlin aquarium. Since its isolation it has undergone many vicissitudes and, as always with a strain passed from laboratory to laboratory, the purity of culture has frequently been called in question. Sea-turtles with pulmonary tuberculosis do not come the way of bacteriologists every day in the week, and laboratories have been unable, therefore, to check the original findings. Saenz has made a careful study of three cultures of the bacillus which he has obtained, and in the *Annales* of the Pasteur Institute sets forth in full detail the morphological characters, cultural properties, and pathogenic action of the organism.

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[1] See report of discussion by Tuberculosis Association, THE LANCET, 1929, ii., 36.

[2] Bull. Acad. de Méd., 1931, cv., 853; Ann. Inst. Pasteur, July, 1931, p. 4.

He concludes that the pathogenic action of the turtle bacillus for the usual laboratory animals is limited to benign local lesions analogous to those produced by strains of saprophytic acid-fast bacilli. A tuberculin prepared from the bacillus was of very weak toxicity, and an antigen prepared after the manner of Boquet and Nègre showed only the properties of other antigens of acid-fast saprophytes. A vaccine made from the bacillus possessed neither prophylactic nor curative properties when tested in laboratory animals. This effect of the vaccine is even more discouraging than the clinical results reported a year ago by W. C. Fowler[3] in a short series of cases at Pinewood Sanatorium, and there seems to be little doubt that the acid-fast saprophyte will not perform the immunising functions of the true tubercle bacillus. Unfortunately, the exponents of the vaccine are not always ready to believe that Friedmann's bacillus is really nothing more than an acid-fast saprophyte.

ROUTINE MEDICAL EXAMINATION OF UNIVERSITY STUDENTS.

In a communication lately published by the Office International d'Hygiène Publique, an account is given of an experiment in preventive medicine carried out at the University of Strasbourg on the initiative and with the pecuniary aid of the Comité National d'Études Sociales et Politiques. The experiment was begun in May, 1929, and among the 66 first-year medical students examined some were found to be suffering from ailments which had been overlooked. This initial success led to further developments in the scholastic year 1929–30, when quite an elaborate system of examinations was devised, with as many as five different attendances: one for a general examination, including measurements of height, weight, blood pressure, &c.; one for an examination of the bones, muscles, and nervous system; a third for the eyes; a fourth for the ears, nose, and throat; a fifth for the teeth. These examinations, carried out by 16 doctors and one dentist, were timed so as not to interfere with the classes of the students. Of 861 first-year students, 406 voluntarily undertook to run the gauntlet of all five examinations. It was found, however, that the attendances at the last three examinations began to fall off, several of the students finding that the first two clinical examinations satisfied their requirements. This experience has led to the reduction of the number of attendances or examinations from five to two, and to putting the special examinations before the general clinical examination. The tabulated findings obtained by this system of combing out are already quite impressive. There were seven cases of pulmonary tuberculosis, five of which had hitherto been overlooked, and 77 cases of cicatricial lesions of the pleura, lungs, or bronchial glands, in 22 of which future periodic supervision was considered necessary. There were eight cases of organic and seven cases of functional disease of the heart requiring special precautions, and eight cases of appendicitis, most of them discovered for the first time. There were also as many as six cases of hyperthyroidism. The ophthalmic examination revealed errors of refraction in 136 cases, in 41 of which they had been overlooked or badly corrected. The tonsils and nasopharynx were found to be in a septic state in 23 students, and among the 259 who submitted themselves to a dental examination there were as many as 198 with neglected dental ailments.

It is probable, we learn, that the example of Strasbourg will soon be followed by the Cité Universitaire of Paris.

THE VIRUS OF MUMPS.

As long ago as 1908 S. Granata produced evidence that the causal agent of mumps belonged to the group of filtrable viruses, and since that time the investigations of C. Nicolle and E. Conseil (1913), M. H. Gordon[1] and M. Wollstein[2] have confirmed and extended this observation. It is true that serial passage in experimental animals was difficult to obtain; in fact, Wollstein alone was successful in this direction, and even she found that the virus soon diminished in virulence and eventually died out. Nevertheless these investigations had this in their favour, that the experimental disease resembled the human one. The more recent claim of Y. Kermorgant,[3] that the virus of mumps is a spirochæte with a filtrable phase, does not carry conviction, and has not been confirmed. F. F. Tang[4] now produces evidence of having obtained yet another virus from mumps. This came, apparently, from the saliva of an adult on the third day of disease, and was capable of passing through a Berkefeld V. candle. It was pathogenic for the guinea-pig, but not for the rabbit or cat—a fact not in keeping with the work of earlier investigators. But the dissimilarity of Tang's work and those of his predecessors in this field does not end there. The disease produced in guinea-pigs by his virus bore no resemblance to mumps. It was characterised by hæmorrhages in the subcutaneous tissues and muscles of the extremities, particularly about the joints, in the lungs, and around the costochondral junctions; and it was highly lethal, for the guinea-pig at any rate, when first isolated. Tang further admits that about the time when these transmission experiments were being made an epizoötic broke out amongst his normal guinea-pigs, the pathological picture of which bore a striking resemblance to that produced by his mumps virus. He was, however, unable to transmit this spontaneous disease, and he got some evidence that the condition might be due to an organism resembling *Bacillus bronchisepticus*. Despite this, it would appear more than probable that Tang was dealing with an extraneous virus, and not the virus of mumps.

BIRTHS AND DEATHS IN SOUTH AUSTRALIA.

In many respects the latest returns from the State of South Australia[5] show vital indices with which western Europe is familiar—for example, a birth-rate declining more rapidly than the death-rate, a corresponding decline in the rate of natural increase of population, and considerable reduction in the mortality from tuberculosis, but an increased loss from cancer. Both the birth-rate (17·2 per 1000) and the crude death-rate (8·4 per 1000) were in 1930 the lowest in the records of the State. For many years South Australia, in common with the other

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[3] *Tubercle*, 1930, xii., 12; see also THE LANCET, 1930, i., 807.

[1] THE LANCET, 1927, i., 652.

[2] Jour. Exp. Med., 1916, xxiii., 353; 1918, xxviii., 377; 1931, xxxiv., 537.

[3] Ann. Inst. Pasteur, 1925, xxxix., 565.

[4] Nat. Med. Journ. China, 1931, xvii., 360.

[5] Statistical Register of the State of South Australia, 1930-31. Part II. Population and Vital. Compiled from official records by W. C. Johnston, F.S.S., Government Statist and Registrar-General of Births, &c.

States of the Commonwealth and New Zealand, has had a very low mortality-rate for infants under one year of age, compared with other countries. In 1930 it was as low as 48 per 1000 live births. The annual mean death-rate of infants under one year of age for the five years 1895–1899 was 110, and for the five years 1925–1929 only 47—a fall of 63. Almost the whole of this improvement is shown to have taken place at ages above one month and under 12 months. The death-rates under one month, under one week, and under one day of age show very little progress and the great majority of those dying under one month of age died from prenatal causes. These facts are, again, comparable with those of this country, and indicate the direction in which efforts for the saving of infant life should be directed. The Mothers' and Babies' Health Association, of which there are 44 branches in the State, is endeavouring to improve the position.

Over half the population are resident in the "metropolis," defined as an area approximately within a ten-mile radius of the General Post Office, Adelaide, and roughly equal proportions of the working population are employed in agricultural and industrial occupations.

PENETRATION OF DRUGS INTO THE TUBERCLE.

It has long been held that the tubercle is so avascular a structure as to be inaccessible, at all events in its caseating centre, to substances injected into the circulating blood. Intra vitam staining methods of investigation are however throwing doubt on this conviction. In a series of articles which appeared in the *Journal of Experimental Medicine*, and are now reprinted,[1] Dr. V. and Dr. M. F. Menkin show that a dye injected intravenously rapidly enters the inflamed area and is fixed there so that it fails to reach the regional lymph-node. By means of a colorimetric comparator, the authors have been able to study and record inflammatory reactions as produced in the peritoneal cavity of frogs which had been injected intra vitam with dyes after having had a sterile inflammation induced with aleuronat or turpentine. It was found that the rate of fall of concentration of the dye was almost twice as great in the capillaries of the inflamed as in those of the normal mesentery. In other words, there was an increased passage of the dye through the capillary wall in the inflamed area. Continuing these researches Dr. V. Menkin found that colloidal iron or ferric chloride, when injected into the inflamed peritoneal cavity, was fixed in the cavity and failed to reach the retrosternal lymphatic nodes, whereas, in the absence of inflammation, the iron accumulated in the nodes. These lymphatic nodes in animals with normal peritoneal cavities contained approximately 56 per cent. more iron than did the nodes of animals with inflamed cavities. He further demonstrated that ferric chloride injected into the circulating blood entered an inflamed area in the skin and that the amount of iron in the inflamed areas was much greater than that found in inflamed areas of animals that had received no iron. Dr. Menkin also found that horse serum injected into an inflamed peritoneal cavity penetrated into the blood stream less rapidly than when injected into a normal cavity. Such accumulation of foreign protein, he believes, explains the phenomenon of local anaphylaxis described by Auer in rabbits sensitised to horse serum. For instance, the antigen accumulating in the inflamed ear reacts with antibody, intensifying a pre-existing inflammatory reaction and finally producing necrosis of the ear. In the third article Dr. Menkin records some results of injecting iron into the circulating blood stream in tuberculosis. Rabbits with extensive bovine tuberculosis were given daily intravenous injections of a 0·25 per cent. solution of ferric chloride. Using the Prussian blue reaction, the author found that the blue colour became intense in the caseous or central part of the tubercle. This result however appeared to depend on the activity of the circulation, for the dye which penetrated from the blood stream into the periphery of an inflamed area failed to enter a central part in which the circulation was relatively inactive. Further work is being done to determine the effect of the accumulation of iron in tuberculous areas on the course of development of the disease. Its bearing upon the clinical value of chemotherapy is obvious.

LADY OSLER.

A brief memoir of Lady Osler, whose companionship of her famous husband made of her a famous woman, has been written by Mr. Arnold Muirhead, for private circulation. Grace Revere was of Huguenot blood; the Rivoires having fled from France to Guernsey on the revocation of the Edict of Nantes, one of them migrated to Boston and became the ancestor of Paul Revere, the patriot-metallurgist. This was Lady Osler's great-grandfather. She married, when little over twenty years of age, Dr. Samuel Gross, a Philadelphia physician, and much her senior, and their house soon became a centre of hospitality, foreshadowing the famous "Open Arms" at Oxford thirty years later. The marriage lasted thirteen years only, and when Dr. Gross died his widow was still a young woman. In 1892 she married William Osler, a devoted friend of her first husband, and it was at her instance that Osler decided to accept the chair of medicine at Oxford in 1905, after holding for 13 years the professorship at Baltimore. How she helped him in his new career has become a legend illustrative of conjugal harmony, and Mr. Muirhead's notes make us understand the wide affection which she inspired in Osler's enormous circle of friends. The battlefield deprived them of their only son, and grief contributed as much as overwork to William Osler's death not long after the struggle had ceased. But Lady Osler continued for nine years to distribute the hospitality of 13, Norham-gardens (The Open Arms), to retain the affections of old friends and gain that of new ones, and fill her days in discharge of duties to which the memory of William Osler called her. This unpretentious little memoir will bring pleasure to many.

PLACENTAL HORMONE AND UTERINE HÆMORRHAGE.

The effects of injection of the "anterior pituitary-like hormone" of the human placenta in cases of menorrhagia and metrorrhagia are reported by A. D. Campbell and J. D. Collip.[1] Forty cases were treated with an extract containing 40-day rat units per c.cm., and the dosage employed varied from 1–2 c.cm., injected subcutaneously daily or every other day, over different periods. From their results the authors gained the impression that in menorrhagia of the simpler types treatment for one week before the menstrual period materially reduces the flow, but more severe cases may require treatment for three months or longer before normal periods are established. In metrorrhagia, when the continuous uterine bleeding had been in a measure controlled, the same tendency to the establishment of normal cycles was not observed; also, intervals of amenorrhœa were apt to appear in such cases. Severe pain occurring during a period subsequent to the institution of treatment may be of favourable prognostic value, and it was noted that the duration of treatment was sometimes considerably shortened in cases where gentle curettage had recently been performed. The histological picture of the endometrium obtained by curettage does not necessarily reflect the clinical symptoms. Since the action of this and other hormones is not fully understood, the exact manner in which an active principle of placental origin may restore normal function in a case of excessive menstrual bleeding cannot at present be explained. In certain of the patients treated, cycles dated from a period of metrostaxis of one to five days' duration, occurring 10 to 18 days after the onset of the previous period of excessive uterine bleeding. No enlargement or engorgement of the breast was observed in any of the cases under treatment.

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[1] Studies on Inflammation, II.–IV. Twenty-second Report of the Henry Phipps Institute for the Study, Treatment, and Prevention of Tuberculosis. Philadelphia: Henry Phipps Institute.

[1] Canad. Med. Assoc. Jour., July, 1931.

INDUSTRIAL MEDICINE AT GENEVA.

THE sixth International Congress on Industrial Accidents and Diseases, which met at Geneva in the first week of August, was a reunion of the two sections which on the last occasion met, one at Buda-Pesth, the other at Lyons. In future the Congress will combine the two branches of the subject; the next will be held in 1935 at Brussels. One of the best group of papers dealt with skin affections due to work. This subject was introduced by Dr. Prosser White, who put forward certain basic principles determining the action of skin irritants which he classified as: (1) direct, injuring by physico-chemical activity; (2) secondary, causing inflammation by stimulating sensory nerves; and (3) indirect, setting up allergy in sensitive persons. He was followed by Prof. M. Oppenheim (Vienna), who exhibited a fine series of illustrations, and Prof. F. Koelsch (Munich), who mainly considered the compensation aspect of trade dermatitis. Other subjects dealt with were the influence of previous health on accidents and industrial diseases, injuries of the blood-vessels, dust of cement and artificial stones, the reaction of the body to industrial poisons, activity and fatigue. Contributions from France, Belgium, and Germany confirmed the comparatively harmless nature of cement dust, previously claimed by American and English observers. A summary of our knowledge on industrial fatigue was communicated by Dr. H. M. Vernon, who presented the influence of occupational environment as elucidated by the Industrial Health Research Board. The papers contributed to the Congress are to be published in full later in the year. The principle of choosing subjects for discussion was adopted at Geneva. Owing however to the acceptance of a number of independent communications, only the reporters had time to summarise their papers, and discussion had to be omitted. In future it is hoped that the chief papers will be circulated beforehand and taken as read, and that independent papers, if accepted at all, will also be taken as read. The sessions could then be devoted to useful discussions and value obtained from the coming together of experts from all over the world. Something is wrong when authorities from Australia, South Africa, the United States, Great Britain, France, Germany, Austria, Italy, Czecho-Slovakia, and other countries are present, but have no chance of exchanging views in open conclave, even though skilled interpreters are at hand to help. The undoubted success of the gathering must be attributed to personal meetings and conversations which took place outside the lecture halls.

COCKROACHES ON SHIPBOARD.

UNLESS they have voyaged in the tropics, and in wooden ships, few realise how disgusting a pest coakroaches can be—and still are, for Surgeon C. L. Williams of the U.S. Public Health Service tells us[1] that 20,000 to 50,000 cockroaches are not an unusual find in a forecastle after fumigation. Iron and steel shipbuilding has reduced their harbourage, and routine anti-rat fumigation has diminished their numbers, but their complete destruction needs a longer exposure to, or a higher concentration of hydrocyanic acid than that required for rats, if the eggs in their protecting egg-cases are to be killed. Rats succumb to 60 g. (2 oz.) of HCN solution per 1000 cub. ft. of air space, acting for two hours, but five times the quantity is needed to kill all cockroaches in the time. This concentration would be too expensive to use over the whole ship, but might be employed in the inhabited part—superstructure, pantries, galleys, and cabins—costing only an extra £2 or so. This is now done at New York on what might be called moral grounds. Immediately after the anti-rat fumigation of a ship the cockroaches are noticed to be far fewer, but in a week or two they are as many as ever, which leads the ship's population to suspect that the effect on rats is just as transient. If the cockroaches were exterminated at the same time there would be less grumbling about the rat fumigation which, whatever people say, has got to be done. A valuable section of Surgeon Williams's paper emphasises the need for pasting strips of paper over openings above or below cabin doors, and over all cracks found, in order to prevent the loss of so easily diffusible a gas as hydrocyanic acid during the period of fumigation; otherwise half of it may be wasted. With the use of a higher percentage of so dangerous a gas the subsequent ventilation of the ship requires greater care. Chloropicrin, the warning gas which is sometimes added to increase safety, is not more deadly to cockroaches, although they do not, as was once feared, take advantage of the warning to secure more effectual cover. All seafarers will be grateful to Surgeon Williams for information in helping them to get quit of a pest.

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[1] Public Health Reports, Washington, July 17th, p. 1680.

POOR-LAW HOSPITALS AND SWEEPSTAKES.—Our Dublin correspondent informs us that a circular letter has been issued by the Department of Local Government and Public Health to the authorities in control of rate-supported hospitals, dealing with their position in regard to sweepstakes. It is stated that one section of the Act imposes on the Minister the duty of applying money received from sweepstakes toward the provision, improvement, or equipment of institutions for the prevention, treatment, or cure of physical or mental diseases, or injuries to human beings. Moreover, it is expressly provided that money so applied should be in addition to, and not in substitution for, or toward, ordinary maintenance, and should not be taken into consideration by the local authority when determining the amount to be expended by them. Decisions with regard to the application of the money cannot be made until the exact amount to be distributed is known, but in the meantime the Minister invites local authorities that intend to provide, improve, or equip an institution and apply for a grant out of the money to be paid to the Minister, to take the matter into consideration and transmit their proposals to the Department.

SPECIAL ARTICLES

EXPERIMENTAL OBSERVATIONS ON DERMATITIS DUE TO DYED FUR.

By G. H. Percival, M.B., Ph.D., F.R.C.P. Edin.,*
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(From the Skin Department of the Royal Infirmary and the Pharmacology Department of Edinburgh University.)

In the winter of 1922–23 it became apparent that the incidence of cases of dermatitis due to the wearing of dyed fur had suddenly increased. Before that period dyed fur had been recognised as a cause of dermatitis, both among those engaged in the preparation of such articles and among those wearing them, but, nevertheless, examples of this type of eruption were rarely seen. The increase noted in 1922–23 was maintained during the winter of 1924, and during these years several papers dealing with the subject were published. In 1924 the Ministry of Health conducted an inquiry into the occurrence of dermatitis attributed to the wearing of fur collars. The main conclusions arrived at in the report of the Ministry[1] (which were based on facts obtained during the inquiry and on papers dealing with the subject in the current medical journals) were as follows: Personal idiosyncrasy on the part of the patient was responsible to some extent for the appearance of the dermatitis, but this susceptibility was specific for a certain class of fur, and did not explain the sudden and unprecedented incidence of fur dermatitis cases. The dermatitis was apparently produced by products of the incomplete oxidation of para- and meta-phenylenediamine. In some instances the mordant used was also thought to be partly responsible. The part played by personal idiosyncrasy was obvious when the proportion of sufferers from fur dermatitis to wearers of dyed furs was considered. The facts recorded in the inquiry did not, however, provide any conclusive evidence as to the nature of the actual constituent in the fur which was responsible for the dermatitis, and any statements regarding this important point were merely tentative. During the process of dyeing, a fur may be treated with various chemicals, including the actual dye itself, and any one of these is theoretically a potential skin irritant. The fact that a particular or even chemically unidentifiable oxidation product of an aniline dye can be isolated from a fur which is known to have been treated with the mother substance of the isolated compound is no proof that such a compound is the cause of the dermatitis which the fur has produced. Direct proof of the specific irritant properties of a substance on the human skin can only be obtained from biological experiments with the substance in question. A more precise knowledge of the nature of the specific susceptibility of the skin towards the irritant may also be obtained if such methods are employed in the investigation of the problem.

Cases of dermatitis due to dyed fur, although less numerous than in the years 1922–24, are still frequently met with. Table I. shows the total number such cases and their percentage of the total number of cases of dermatitis in females over 15 years of age who have been treated in the skin department of the Edinburgh Royal Infirmary during the decennium 1920–30 :—

TABLE I.

A = Total number of cases of dermatitis in females over 15.
B = Number of cases due to fur.
C = Percentage of total due to fur.

Year.	A.	B.	C.	Year.	A.	B.	C.
1920	174	1	0·57	1926	238	16	6·72
1921	185	1	0·54	1927	168	7	4·18
1922	135	1	0·73	1928	252	13	5·15
1923	194	22	11·34	1929	362	23	6·35
1924	233	37	15·88	1930	385	13	3·37
1925	201	17	8·45				

For obvious reasons, the complaint is almost exclusively met with in females, so that figures dealing only with dermatitis in females have been given for the total annual number of dermatitis cases in the Table. As no cases of fur dermatitis have been met with in young children, the numbers given for all classes of dermatitis have been limited to cases over 15 years of age. The number of cases of fur dermatitis given for 1920–22 may be slightly low, since attention was not concentrated on the possibility of fur being the cause of dermatitis until the condition became prevalent in 1923. Nevertheless, the abrupt rise in 1923–24 is undoubtedly real, for the numbers were then much higher than in the succeeding years, during which the condition was well recognised.

Since the incidence of this type of eruption is still considerable, an investigation into its causation and nature has been undertaken. Furthermore, as the problem involved was a concise one, dealing with a type of dermatitis due to an irritant which could presumably be definitely ascertained, it was thought that any observations which might be made during the course of the investigation would have some bearing on the related problems presented by other types of dermatitis, either due to external or internal causes.

Investigation.

The irritant properties of two lambskin furs, one dyed brown and the other grey, which were known to have caused dermatitis, were examined. The experiments carried out with the brown fur were of a preliminary nature to test out the methods which it was proposed to use throughout the investigation, while those performed with the grey fur were more detailed, and were pursued further.

The main issues of the problem may be stated as follows :—

(1) Is the skin irritation produced by a dyed fur due to the fur itself or to the chemicals used in the dyeing process ?

(2) Are any special conditions, such as moisture or a greasy skin, necessary before a dyed fur can produce skin irritation, and, if so, will apparently normal skins react to certain dyed furs provided such favourable conditions are present ?

(3) Can a skin, which has previously tolerated a given fur, subsequently develop an eruption when again brought into contact with this fur ?

(4) What substance in the fur is responsible for the production of dermatitis ?

(5) What concentration of this substance is required in order to produce dermatitis ?

(6) Does the action of the irritant substance, when this is present in the concentration required to produce dermatitis, differ on normal skins and on the

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* In receipt of a part-time grant from the Medical Research Council.

skin of subjects who have suffered from dermatitis due to the particular irritant in question ? In other words, is the irritation which is produced by the substance entirely due to a constant specific pharmacological action depending on and proportional to its concentration, or must the skin possess or develop the property of reacting to the application of the substance with a special type of reaction before the latter can produce any harmful effects ?

(7) If such a qualitative difference does exist between normal skins and those which are irritated by compounds contained in dyed fur, what is the degree of this difference ?

(8) Can the irritant properties exhibited by a given dyed fur be removed by appropriate chemical or physical manipulation ?

The method used throughout in the investigation of these questions was that of the contact eczema test.

This test was introduced by Jadassohn and Bloch to detect the external irritant in cases of dermatitis, and since its introduction it has been extensively used on the continent as a routine practice in the investigation of such cases, and in special investigations on the nature of dermatitis. The method is simple, and consists in the application of the suspected irritant in low concentration, either in solution, paste, or ointment form, to a small area of the skin of the back. Solutions are applied as soaks on small linen squares. The test application is covered with linen or oiled silk and kept in position with adhesive plaster. The application is removed at the end of 24 hours, and the skin examined. If the test is positive, the skin which has been in contact with the test substance is red and slightly œdematous, and the surface is studded with minute vesicles. It presents the appearance of a localised area of dermatitis. The area in direct contact with the adhesive plaster is frequently red and the hair follicles prominent, but this quickly subsides, although in some cases the skin is actually sensitive to the ingredients of the plaster, and the redness persists. Sometimes a positive reaction is not evident when the tests are removed and the skin examined at the end of 24 hours, but develops during the succeeding 24 hours. It is necessary, therefore, to verify all negative reactions 24 hours after removal of the test applications, in case a late positive reaction develops. A positive result is a direct proof that the substance applied is capable of producing a dermatitis in the concentration employed, and the degree of sensitivity of the skin towards the substance can be ascertained by varying the concentration of the latter.

While such tests are of immense value in elucidating the cause of individual cases of dermatitis, they have also been used to demonstrate the relative susceptibility of the skin of patients suffering from dermatitis to react to several types of irritants, as compared with the skin of normal individuals. Thus Jaeger[2] found that 50 per cent. of cases of dermatitis gave an abnormal inflammatory reaction to certain volatile oils, while only 5 per cent. of normal individuals reacted. Using similar substances, Bloch[3] found that 35 per cent. of the dermatitis cases reacted, and only 5 per cent. of normal individuals gave positive reactions. Evening[4] obtained positive results in 36 per cent. of dermatitis cases, and 2·2 per cent. of normal individuals, and Schürch[5] obtained results of a similar order.

BROWN LAMBSKIN DYED WITH PARAPHENYLENEDIAMINE.

The first fur to be investigated, using this method, was a brown lambskin which had been dyed with paraphenylenediamine. Three female patients, who were known to have suffered from dermatitis of the neck, due to the wearing of dyed fur collars, were tested. In each case the rôle of the collar in the production of the dermatitis had been proved on several occasions by its disappearance when the fur ceased to be worn, and its subsequent reappearance on the reapplication of the fur to the neck. Three tests were made in each of the three cases, using the patient's own fur, the brown lambskin and undyed lambskin. Portions of the furs were clipped off the skins, and three applications were made with each fur, a sample of each fur being applied dry, moistened with distilled water, and moistened with saline. The tests were removed and read at the end of 24 hours, and again at the end of a further 24 hours. The results are given in Table II.

TABLE II.

Results of contact tests with paraphenylenediamine-dyed brown lambskin fur applied for 24 hours in three patients who had suffered from dermatitis due to dyed fur collars.

M.D.W. = Moistened with distilled water.
M.S. = Moistened with saline.

Case.	Patient's own fur.			Dyed brown lambskin.			Control undyed lambskin.		
	Dry.	M.D.W.	M.S.	Dry.	M.D.W.	M.S.	Dry.	M.D.W.	M.S.
1	+ + +	+ + +	+ + +	–	+ + +	+ + +	–	–	–
2	+ + +	+ + +	+ + +	+ +	+ + +	+ + +	–	–	–
3	+	+ + +	+ + +	+	+ + +	+ + +	–	–	–

+ = redness persisting for 24 hours.
+ + = redness and œdema.
+ + + = redness, œdema, and minute vesiculation of the surface, and itching.
+ + + + = redness, marked œdema, and vesiculation of the surface and itching.

The positive reactions to a single application of the dyed furs persisted for 10 to 15 days, passing through a dry scaly stage before the skin resumed its normal appearance.

It is evident from these results that the irritant properties of the dyed lambskin are due to one or more of the constituents used in the dyeing process. It has also been shown that moistening the fur with either distilled water or saline solution increases its irritant properties, although it is to be noted that preliminary moistening is not necessary for the production of a positive reaction. In all cases the patient's own fur and the dyed brown lambskin fur caused some staining of the skin, even when applied in the dry state, and this staining was due to some of the dye becoming dissolved either in the moistening fluids or in the perspiration or oily secretion of the skin. Case 2 had a coarse, greasy skin, and in her the dry applications caused more staining than in Cases 1 and 3. The fact that the reactions to the dry furs were less marked than those to the moist preparations suggests that the concentration of dissolved dye bears a direct relationship to the intensity of the reaction which it produces.

To control these observations, the brown lambskin fur was applied dry, moistened with distilled water, and with saline, to the skin of 15 patients suffering from various types of skin diseases. The patients were retested with similar applications after an interval of 16 days to verify the results of the first tests and to ascertain whether it was possible for a skin which had shown a negative reaction to the first application to develop an altered reaction as a result of this application, so that a positive reaction would be given to subsequent tests. The results are given in Table III.

The fur did not produce a positive reaction in these patients when applied for the first time. In most of these cases all the fur applications produced some degree of staining of the skin, and in several the skin was excessively greasy. This staining is well shown in Fig. 1. It may therefore be concluded that normal skins do not tend to react to the dye dissolved from the brown lambskin fur, even when this substance is in prolonged contact with the skin, either in watery or oily solution. One case, however, developed a positive reaction to all three applications of the fur on testing a second time, although the results of the first test had been negative. This patient's skin apparently developed a susceptibility towards some substance in the fur, and presumably the altered reaction which occurred had been brought about as a result of the first application.

TABLE III.

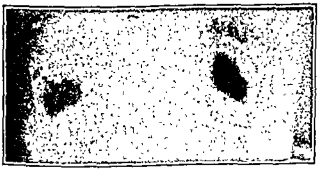
Results of tests with brown lambskin fur in 15 patients suffering from various types of skin disease. The fur was applied dry, moistened with distilled water, and with 0·9 per cent. saline. Each patient was retested after an interval of 16 days.

Disease.	Cases.	First test.		Second test.	
		Pos.	Neg.	Pos.	Neg.
Dermatitis venenata ..	2	0	2	0	2
Dermatitis.. ..	3	0	3	0	3
Dermatitis artefacta ..	2	0	2	0	2
Lupus	1	0	1	0	1
Sycosis	1	0	1	0	1
Impetigo	1	0	1	0	1
Asthma and prurigo ..	1	0	1	0	1
Ulcus cruris	4	0	4	1	3

Pos.=positives; Neg.=negatives.

These preliminary experiments show that the skin of patients who are the subjects of fur dermatitis reacts differently from that of normal individuals to the application of a dyed fur which possesses irritant properties, even when the conditions favourable to the production of a dermatitis reaction are equal in both types of individual. They also show that the skin of a patient suffering from dermatitis, due to some other cause, is not specially apt to react to dyed fur, suggesting that the constituent in the dyed fur responsible for the reaction in susceptible cases is not a universal irritant for eczematous individuals. A specific capacity on the part of the skin to react with such substances appears to be a necessary factor before any reaction takes place. This capacity bears no relationship to the oiliness or moisture of the skin, as shown by the negative reactions obtained in normal individuals in which such conditions were present to a marked degree. The experiments further demonstrate that it is apparently possible for a previously normal skin to develop a sensitivity towards dyed fur as a result of one application of the fur.

FIG. 1.



This patient's skin was greasy, and marked staining of the skin with the dye from a brown lambskin fur applied dry (left) and moistened (right) has occurred. The dry preparation has caused almost as much staining as the moist. No reaction followed either application.

EXPERIMENTS WITH GREY LAMBSKIN.

On the basis of these preliminary experiments, a further series of experiments was carried out to test the irritant properties of a grey dyed lambskin, which had been responsible for a few cases of dermatitis. This fur had undergone treatment with solutions of proprietary substances, which will be referred to as A, B, C, and D. Substance A, which belonged to that class of phenylenediamine compounds known as ursols, and which contained paraphenylenediamine, but not metaphenylenediamine, gave a purplish-grey solution when allowed to oxidise in air for several days, and when mixed with hydrogen peroxide developed a medium-grey colour. Solutions of the other substances were colourless. In the dyeing process hydrogen peroxide was used to develop the required grey colour.

Contact tests were performed with this fur in 50 patients suffering from various types of skin lesions, but with no history of previous fur dermatitis. The fur was applied moistened with distilled water, since in the preliminary experiments with the brown lambskin fur it had been shown that in fur-sensitive individuals a more intense reaction was given when the fur in question was applied moist. Each individual in the series was retested with the fur after an interval of 16 days had elapsed from the time of the first test. The results are shown in Table IV.

TABLE IV.

Results of contact tests with moistened dyed grey lambskin in 50 patients suffering from various skin lesions. The tests were repeated after an interval of 16 days.

Disease.	Cases.	First test.		Second test.	
		Pos.	Neg.	Pos.	Neg.
Dermatitis	22	0	22	0	22
Psoriasis	7	0	7	0	7
Ulcus cruris	4	0	4	0	4
Nævus	3	0	3	0	3
Lupus vulgaris	3	0	3	0	3
,, erythematosus ..	2	0	2	0	2
Impetigo contagiosa ..	2	0	2	0	2
Sycosis	2	0	2	0	2
Prurigo	2	0	2	0	2
Xeroderma	1	0	1	0	1
Lichen planus	1	0	1	0	1
D. herpetiformis	1	0	1	0	1
Total	50	0	50	0	50

The results show that the fur does not contain any substance which has universally toxic properties in the concentrations obtained in the experiment. Again, staining of the skin by the fur was frequently in evidence.

Twelve patients known to have suffered previously from fur dermatitis were then tested with moist applications of the grey dyed lambskin fur. The clinical histories of those patients strongly suggested that the dermatitis from which they had suffered was due to the wearing of dyed fur; the dermatitis persisted until the fur ceased to be worn, and eczema tests with the fur afforded absolute proof of the causal relationship of the fur to the dermatitis. In some cases other types of dyed fur, which were substituted for the originally offending article, also caused dermatitis, while in others a dyed fur had been found which could be worn with impunity.

Each of these patients gave a positive reaction to the test application of the grey lambskin. In four cases the positive reaction was not evident until 24 hours after the test applications had been removed —i.e., 48 hours after their first application. The reaction was intense in every case, and consisted of redness, œdema, and minute vesiculation, and was accompanied by a considerable degree of itching. From the clinical histories of these patients it will be seen that, although the patient had suffered from dermatitis produced by a fur collar, it had been subsequently possible to obtain and to wear a dyed fur which did not produce any harmful results. This being so, the results of the tests with the grey fur might well have been negative.

The positive results obtained in these cases, when compared with the uniformly negative results found in other types of skin disease, demonstrate the existence of a special reactivity or sensitivity on the part of the skin in the former group. They also show that patients who have shown this type of sensitivity to one particular dyed fur are extremely liable to react similarly to other types of dyed furs.

Since several chemical substances had been employed in the preparation of this fur, these were tested out separately on fur dermatitis Cases 1, 2, 4, 9, and 13, and also on 50 patients suffering from various types of skin disease. The following test solutions were used:—

Solution I. = 0·5 per cent. aqueous solution of "A."
„ II. = 0·5 „ „ „ "B."
„ III. = 0·5 „ „ „ "C."
„ IV. = 0·5 „ „ „ "D."

The results in fur dermatitis cases are given in Table V.

TABLE V.

Results of contact tests with solutions I. to IV. applied for 24 hours in fur dermatitis cases.

Case.	Solution.			
	1	2	3	4
1 ..	++++	—	—	—
2 ..	++++	—	—	—
4 ..	++++	—	—	—
9 ..	++++	—	—	—
10 ..	++++	—	—	—

Forty-nine of the 50 cases suffering from skin disease, other than fur dermatitis, gave a negative reaction to all four test solutions on the first application, and also on a second application performed after an interval of 16 days. One case gave a strong positive reaction to solution 1 (0·5 per cent. "A"), while the reactions to solutions 2, 3, and 4 were negative. This patient was suffering from a leg ulcer, and had never worn dyed fur. When tested with the grey dyed lambskin she gave a strongly positive reaction.

The above results definitely prove that the potential irritant properties possessed by the grey lambskin fur are due exclusively to the presence therein of "A," or of some decomposition or oxidation product of this substance which had developed in the 24 hours during which it was in contact with the skin. The essential part played by a specific sensitivity of the skin in the production of dermatitis has again been demonstrated, and the results obtained with the fur itself have been confirmed and more accurately defined. The specific sensitivity of the skin which is associated with the dermatitis reaction is not possessed to any extent by normal skins.

In all, 100 cases of various types of skin disease (other than fur dermatitis cases) were tested either with the grey fur or with "A," and of these only one displayed any evidence of sensitivity, whereas a positive reaction was given by all fur dermatitis cases tested. Such a reaction must, therefore, be considered as abnormal, and must depend on some defect in the skin itself.

In order to ascertain whether it was unaltered "A" or its oxidation products which were reacting with the abnormal skin, a 24-hour old mixture of 0·5 per cent. "A" solution and hydrogen peroxide was tested on fur dermatitis Cases 1, 2, 4, 9, and 10. The results are given in Table VI.

These observations show that the positive results obtained with the fur itself and with freshly prepared 0·5 per cent. "A" solution were due to the skin reacting either with unchanged "A" or with its early oxidation products, and that the more completely substance "A" was oxidised the less was the sensitised skin likely to react with it.

TABLE VI.

Results of contact tests with 0·5 per cent. solution of compound "A" mixed with hydrogen peroxide for 24 hours.

Case	1	2	4	9	10
0·5 per cent. "A" solution + hydrogen peroxide	—	—	++	—	++

While the marked contrast between the number of positive reactions obtained in fur dermatitis cases and in non-fur dermatitis cases is strong evidence that, in the former group, the skin is hypersensitive to substance "A," it gives no indication of the degree of this hypersensitivity. The following experiments were performed in order to gain an approximate quantitative estimate of this factor. Fifty patients suffering from various types of skin disease who had previously given a negative reaction either to 0·5 per cent. "A" or to the grey lambskin fur were tested with 1 per cent., 5 per cent., and 10 per cent. solutions of "A." No positive reactions were obtained with the 1 per cent. solution, negative reactions were given by 48 patients to 5 per cent. and 10 per cent. solutions, and two cases reacted to 5 per cent. and 10 per cent. solutions. Fur dermatitis Cases 1, 4, 5, 10, 11, and 12, and the case of leg ulcer, which had given a positive reaction to 0·5 per cent. "A" and to the grey fur (Case 13) were tested with 0·5 per cent., 0·1 per cent., 0·05 per cent., and 0·005 per cent. solutions of "A" and with the grey fur. The results are shown in Table VII.

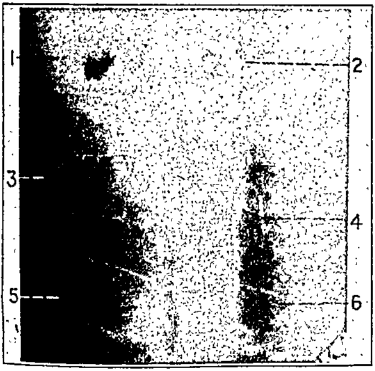
TABLE VII.

Results of contact tests with grey lambskin fur, 0·5 per cent., 0·1 per cent., 0·05 per cent., and 0·005 per cent. solutions of "A" in fur dermatitis and "A" sensitive cases.

Cases.	Fur.	Solutions of "A" (per cent.).			
		0·5	0·1	0·05	0·005
1	++++	++++	+++	+++	—
4	++++	++++	+++	+++	+
5	++++	++++	+++	—	—
10	++++	++++	+++	—	—
11	++++	++++	+++	—	—
12	++++	++++	—	—	—
13	++++	++++	++++	++++	++++

These experiments show that the difference in sensitivity to dyed fur between a skin which is intolerant to it and a normal skin is of considerable magnitude. Thus Cases 4 and 13 react to at least 1/2000 of the concentration of "A" to which a normal skin is tolerant. Case 4. Cases 5, 10, and 11, and Case 12 react, respectively, to 1/200, 1/100, and 1/20 of the same concentration. The position might be regarded from the opposite standpoint, and Cases 4 and 13 considered as being at least 2000 times, Case 4 200 times, Cases 5, 10, and 11 100 times, and Case 12 20 times as sensitive to "A" as the normal skin. Moreover, it is possible that the normal skin would tolerate concentrations of "A" higher than 1 : 10, in which case the sensitivity of the reacting skins would be correspondingly greater. When the positive reactions obtained with varying dilutions of "A" are compared with those obtained with the ursol-dyed fur, it is possible to gain some idea of the concentration of "A," which is presumably dissolved out of the fur and brought into contact with the skin to give rise to the positive skin reaction produced by the fur. In Cases 1 and 2 this must have been between 0·05 per cent. and 0·005 per cent.; in Cases 5, 10, and 11 between 0·05 per cent. and 0·1 per cent.; and in Case 12 between 0·5 per cent. and 0·1 per cent. Case 12 further demonstrates that it is possible for a solution of "A," having a concentration of at least between 0·1 per cent. and 0·5 per cent., to be formed from the grey fur when this becomes moist.

FIG. 2.



Case 6, Table VIII., tested with fur samples 1–6.

After application of test—
1 = Reaction to fur 3 .... 36 hours.
2 = " " " 2 .... 36 "
3 = " " " 1 .... 36 "
4 = " " " 4 .... 36 "
5 = " " " 5 .... 36 "
6 = " " " 6 .... 36 "

An interesting and important point, conclusively shown by the results of the tests with different concentrations of "A," is that the sensitivity of the skin in fur-sensitive cases shows wide individual variations. The results also show, although less definitely, that the intensity of the reaction in individual cases varies directly with the concentration of "A." It seems probable, however, that the range of concentrations throughout which graded reactions occur is small, and that, once a certain concentration is reached, the intensity of the reaction obtained in maximal.

THE EFFECTS OF CLEANING.

The substance in the grey fur which took part in the production of the reaction exhibited by abnormal skins when in contact with the fur having been identified as substance "A" or an early oxidation product of this substance, attempts were made to ascertain whether it could be removed by special methods. For this purpose seven samples of lambskin fur dyed with "A," but subjected to different cleaning processes, were tested on eight fur-sensitive cases, along with the original grey lambskin used in the previous experiments. The cleansing processes consisted in washing in water or benzene for varying periods, brushing, or drumming with sand. It was not possible to test out all eight samples in each case, while in some individual cases the same sample was tested on several occasions. The results are given in Table VIII.

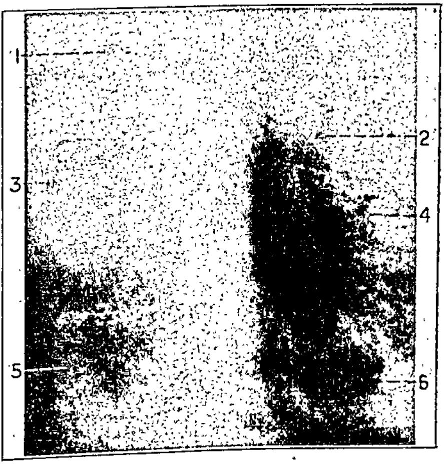
TABLE VIII.

Results of contact tests with original "A" dyed grey fur (fur 1) and with seven grey furs dyed with compound "A," and subjected to various cleansing processes, in fur-sensitive cases.

Case.	Fur. Sample.							
	1	2	3	4	5	6	7	8
1	+ + + +	0	0	0	0	–	+ + +	+ + +
2	+ + + +	0	0	0	0	–	+ + +	+ + +
4	+ + + +	+ +	+ +	+ +	+ +	–	+ + +	+ + +
5	+ + + +	+ +	0	+ +	0	–	+ + +	+ + + +
*6	+ + + +	+ +	+ +	+ +	+ +	–	+ +	+ + + +
7	+ + + +	+ +	+ +	+ +	–	–	+ +	+ + +
8	+ + + +	+ + +	+ + +	+ + +	+ +	–	+ + +	+ + + +

* Reactions to samples 1–6 shown in figure (2). 0 = No test performed.

FIG. 3.



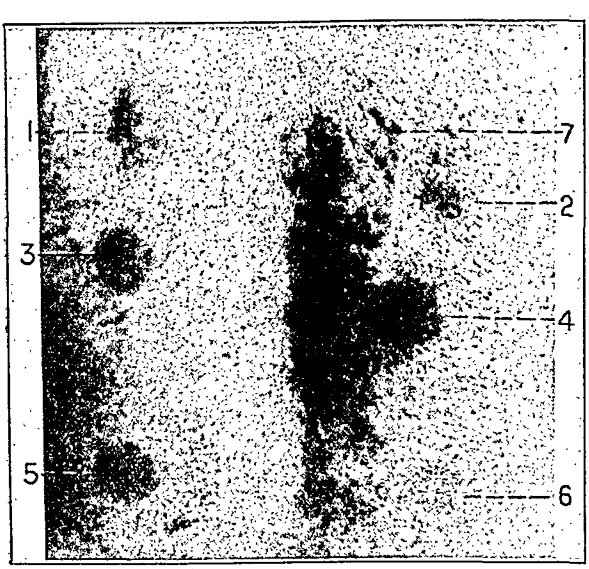
Reactions given by Case 4 to samples 1, 2, 3, 4, and 5.

After application of test—
1 = Reaction to fur 1 .... 5 days.
2 = " " " 3 .... 5 days.
3 = " " " 1 .... 30 hours.
4 = " " " 2 .... 30 "
5 = " " " 4 .... 30 "
6 = " " " 5 .... 30 "

This Table shows that with adequate cleaning methods it is possible to reduce considerably, and perhaps to eliminate altogether, the substance in the dyed fur which causes the hypersensitive skin to give a dermatitis reaction. A comparison with the reactions given by Case 4 in Tables VI. and VII. shows that any solution of "A" derived from fur 6 when in contact with the skin must have been of a lower concentration than 0·005 per cent., since Case 4 was capable of reacting to this concentration, whereas she gave no reaction to fur 6.

In this investigation the reactions given by Case 4 were of special interest. This patient was first tested with furs 1, 3, and 6. No reaction was obtained with fur 6, while a well-marked reaction occurred with fur 1, and a papulo-erythematous vesicular reaction occurred with fur 3. The reaction to fur 1 was still visible at the end of five days as a dry, pink, scaly area, but that to fur 3 had almost faded. At this time fur 1 was reapplied, together with furs 2, 4, and 5; 24 hours later the tests were read and positive results (Fig. 3) were found in each case. During the following few days a flare-up of the subsiding positive reactions to the first application of fur 1 and of fur 3 occurred. This exacerbation gradually subsided, along with the reactions to the second application of fur 1 and of furs 2, 4, and 5 during the succeeding 37 days. Twelve days after the second application of fur 1, and at a time when the reactions to this application and to furs 2, 4, and 5, and also the exacerbation of the reactions to the first application of furs 1 and 3, were subsiding, a third application of fur 1 was made. A well-marked erythemato-vesicular reaction followed (Fig. 4), but, contrary to expectations based on the experience with fur 3, there was no general flare-up of the fading reactions to furs 1, 2, 3, 4, and 5. Fifty days from the date of the first test applications the skin of the back had resumed its normal appearance. Fur 3 was again applied at this time, and a positive result was obtained at the site of application only (Fig. 5). The interesting feature of these results is the flare-up of subsiding positive reactions on one occasion, which was coincident with the application of fresh tests to adjacent areas. This point will be discussed later.

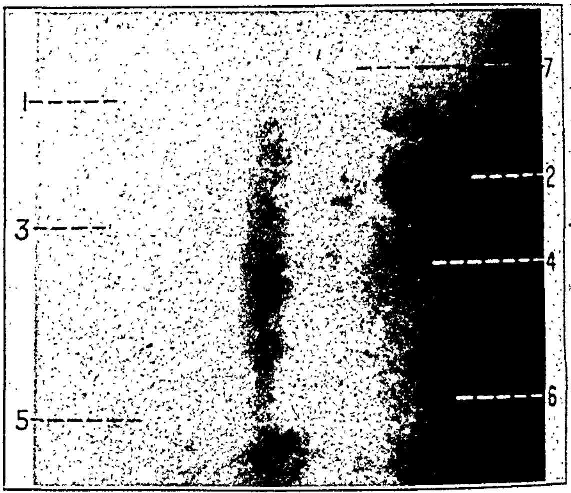
FIG. 4.



Reaction given by Case 4 to samples 1, 2, 3, 4, and 5.

After application of test—
1 = Persisting reaction to fur 1 .... 17 days.
2 = ,, ,, ,, ,, 3 .... 17 ,,
3 = ,, ,, ,, ,, 1 .... 12 ,,
4 = ,, ,, ,, ,, 2 .... 12 ,,
5 = ,, ,, ,, ,, 4 .... 12 ,,
6 = ,, ,, ,, ,, 5 .... 12 ,,
7 = Reaction to ,, ,, 1 .... 30 hours.

FIG. 5.



Reactions given by Case 4 to samples 1, 2, 3, 4, and 5.

1, 3, 4, 5, 6, 7 represent the corresponding sites in Figs. 2 and 3 50 days after the first tests were applied. The reactions have completely faded, leaving only a faint pigmentation of the skin.

2 = Reaction to fur 3, 36 hours after the application of the test.

ATTEMPTS TO TRANSFER SKIN SENSITIVITY TO NORMAL SKINS.

Serum was obtained from Cases 4 and 13, both of whom had shown the greatest skin hypersensitivity to "A," and 0·2 c.cm. of each sample was injected intradermally into four areas of the skin of the forearm in four individuals who had given a negative reaction to contact tests with 10 per cent. "A." After four hours the injected areas were tested with 0·5 per cent. "A" applied to a scratch and also as a contact test. (Method of Prausnitz and Küstner.) Control scratch and contact tests were made on adjacent uninjected skin. No positive reactions were obtained with any of the tests. Both forms of test were repeated 24 hours later, but again the results were negative.

SUMMARY OF THE FOREGOING EXPERIMENTAL RESULTS.

(1) The potential irritant properties of a dyed fur are due to some substance used in the dyeing process, and not to mechanical irritation by the fur.

(2) Normal skins do not react to a dyed fur even under conditions in which the fur in question would produce dermatitis in a fur dermatitis patient.

(3) The dermatitis is due to a hypersensitive skin reacting with some substance in the dyed fur in concentrations with which normal skins do not react, and, therefore, this reaction may be termed allergic.

(4) The substance in the fur investigated with

which the allergic skin reacts is "A," or an early oxidation product of this compound.

(5) Fur dermatitis cases react to concentrations of "A," varying from 0·005 per cent. to 0·5 per cent., and in these cases there is considerable individual variation with regard to the concentration necessary to produce dermatitis.

(6) Most normal skins fail to react with a 10 per cent. solution of "A" although some were found to react with a 5 per cent. solution.

(7) The degree of sensitivity of the skin to dyed fur found to exist in fur dermatitis cases ranged from at least 200 times to 2000 times that found in non-fur dermatitis cases.

(8) It is possible for at least a 0·5 per cent. solution of "A," or its oxidation products, to be formed in the fluid secretions of the skin when in contact with the dyed fur. This type and concentration of solution does not produce dermatitis in non-fur dermatitis cases.

(9) Dermatitis resulting from a single application of a minute concentration of a chemical towards which the skin is allergic may persist for several weeks.

Comment.

Two conclusions may justifiably be drawn from the results obtained in the foregoing experiments. The first is that "A" is the only factor present in the fur which takes any part in the production of dermatitis. The second, and the more important from the point of view of its general application, is that the dermatitis depends on an allergic state of the skin, and that it is idiosyncratic in nature. The term allergy is here used in its wider sense, according to the definition of Bloch, which is as follows:—

> "Allergy is that state which has as its basis the property of certain groups of cells (organs) of the living organism to react in a specific manner when brought in contact with a substance which is, as far as is known, foreign to the organ or cells; the characteristic of this specific pathologic process lies in the fact that it is caused by the reaction of this exogenous substance with its specific cellular fixed antibody. The basis and essence of allergy is the ability of the living cell to react with the production of specific antibodies to the stimulus of foreign substances, which are therefore called antigens, as well as the fact that the contact of the antigen with its specific cellular fixed antibody causes a disturbance of cellular life which usually results in an inflammatory reaction."

The term idiosyncrasy means that the reactions caused by the exogenous substances in question occur only in a small percentage of individuals. The reason for idiosyncrasy is therefore the presence of the allergic state in those individuals who are idiosyncratic. As a result of allergy, idiosyncratic individuals react to substances which produce no effect in normal individuals. Such substances are, therefore, irritant and toxic for the former class, but perfectly harmless for the latter. This toxic effect, however, is not proportional to the dose or concentration of the substance coming in contact with the cells, but is entirely dependent on the state of these cells. The substance only precipitates a reaction when the cells are in a state of allergy. Such a reaction is not due to the pharmacological action of the substance, since this would be approximately the same in all individuals, and would be proportional to the amount of the substance acting on the cells. It has been shown that allergic phenomena, which were originally considered to be brought about only by antigens of a protein nature, can be caused equally well by crystalline substances.

The results of the tests show conclusively that positive reactions occur only in idiosyncratic individuals, and that they are due to the allergic state of the skin towards "A." In this class of individual the intensity of the reaction bears no constant relationship to the concentration of "A" applied to the skin. In one case a concentration of 0·5 per cent. may be required, while in another 0·005 per cent. will suffice. The uniformly negative results obtained with 0·5 per cent. "A," and the large percentage of negative results obtained with 10 per cent. "A," in individuals who had not suffered from fur dermatitis, show that even in these strengths the pharmacological action of compound "A" cannot be described as irritant. Nevertheless, throughout the range 0·5 per cent. to 10 per cent. several positive reactions were obtained, and these individuals may be considered idiosyncratic in the same way as those sensitive to lower concentrations, but in the former case the allergy is of a less delicate or sensitive nature. It is possible that with concentrations higher than 10 per cent. compound "A" would display universal irritant properties, which would then depend on the pharmacological action of the drug, be proportional to the dose, and independent of the state of the skin in individual cases. When it is considered that reactions were obtained with concentrations from 1/200 to 1/2000, which was tolerated by normal individuals, it is obvious that some factor other than the direct action of "A" must be mainly responsible for the reaction. This factor can only be the altered state of reactivity of the skin cells, or, in other words, allergy. Apart from the evidence derived from a comparison of the active concentrations in reacting individuals and the concentrations tolerated by individuals, the behaviour of the positive reactions which were obtained denotes their allergic nature. The latent period observed between the removal of the test application and the appearance of a positive result, and the tendency for positive reactions to flare-up as a result of subsequent applications of "A," are both typical of allergic phenomena.

The results obtained by Burgess and Usher[6] are comparable to the more general findings in the present investigation. They found that of 200 normal persons tested with a face lotion which had been associated with dermatitis 0·5 per cent. gave a positive reaction, while a reaction was obtained in all patients who had suffered from the dermatitis. They record the interesting observation that in several of these dermatitis patients a positive reaction could only be obtained at the site of the healed dermatitis, so that in those cases the allergy was localised to certain skin areas. No example of regional allergy was found in the present investigation, and in every case the allergic phenomena were elicited over wide areas of skin. Beyond demonstrating the idiosyncratic and allergic nature of the disease, and proving that only one constituent of the lotion was capable of producing it, Burgess and Usher performed no experiments to demonstrate the quantitative nature of the allergy.

The fact that in the present experiments positive reactions were only obtained when "A" was applied to the intact skin, and that uniformly negative results were obtained by the scratch method, points to the allergy being localised in the epidermis. It also points to the necessity of carrying out both types of test when an allergic condition of the skin is suspected.

Attempts to demonstrate the presence of free antibodies in the serum, by the passive transference method of Prausnitz and Küstner, and so to prove the antibody-antigen nature of the positive reactions obtained in the skin, failed in three cases. Successful results, although frequent in urticaria with this method, have only rarely been obtained in cases of dermatitis. Biberstein has, however, actually demonstrated the Prausnitz-Küstner reaction in ursal dermatitis. A negative Prausnitz-Küstner reaction merely suggests that demonstrable antibodies are not present in the serum, and does not exclude the probable antigen-antibody nature of the allergic reaction of the skin cells.

The facts observed with compound "A" therefore show that any skin reaction which occurs with this substance in low concentration is due to the allergic conditions of the skin, and not to the primary irritant action of "A." There are ample opportunities for "A" present in a fur to dissolve in the secretions of the skin when the fur is brought into contact with the skin, and it is probable that the allergic skin only reacts to "A" when in solution.

The latent period observed clinically between the first time of wearing a fur and the development of dermatitis, which may amount to a few weeks, may be due to several factors. When short, it is probably a delayed reaction to the first contact with the fur, similar to that noted in the reaction to skin tests. When of longer duration, it may either be due to an initially non-allergic skin developing allergy, as has been shown to be possible in the preliminary experiments, or to the fact that in an allergic person no direct contact between the skin and the dyed fur has occurred during the first two or three occasions on which the fur has been worn.

The results obtained in the foregoing experiments suggest that similar processes are responsible for the production of dermatitis by furs dyed with other amines, diamines, aminophenols, diphenols, and their substitutes. No definite comparisons are justifiable, however, and any fur which has been associated with dermatitis must be subjected to similar biological analysis before a definite statement can be made regarding the nature and cause of the dermatitis. Chemical analysis of the fur yields no information as to its possible biological effects. It is a well-known clinical fact, and one which is illustrated by the case-histories of the fur-sensitive cases here reported, that an individual may suffer from dermatitis when wearing one dyed fur, but not another. The reason for this may be that the pre-existing or subsequently developed allergic state of the patient's skin is specific for one amine body, or that the fur which is not associated with dermatitis contains no available antigen.

It has already been pointed out that the experiments with "A" show that this substance is not, strictly speaking, an irritant, and that when signs of inflammation follow its application to the skin in an idiosyncratic person this is entirely due to the skin being in a highly intolerant or allergic state. From the series of tests carried out with "A" dyed fur and with "A" on unselected cases of skin diseases, it appears that a very small proportion of individuals exhibit an idiosyncracy to "A," and when the number of cases of fur dermatitis is compared with the total number of fur-wearers this proportion is infinitely less. Incidentally, it has been shown that the existence of various types of skin disease, other than fur dermatitis, are not associated with an unduly high proportion of individuals sensitive to "A." When several substances to which individuals are known to have shown an idiosyncrasy are compared, it is found that the number of idiosyncratic individuals varies greatly according to the substance. Thus Bloch[7] quotes experiments to show that 80 per cent. of all individuals are sensitive to ascaris, 60 per cent. to poison ivy, and 45 per cent. to orthoform. Moreover, by using concentrated extracts of primula, he has been able to produce an allergic state in the skin of 100 per cent. of persons, thus overcoming the individual constitutional factor (idiosyncrasy), and converting an idiosyncrasy into a pure allergy. These facts would have to be born in mind when assessing the extent to which any compound in a dyed fur was capable of participating in or precipitating allergic reactions of the skin.

They also have an important medico-legal bearing. First, the fundamental rôle played by allergy in such cases, and, secondly, the proportion of normal to idiosyncratic individuals ought to be considered when compensation claims arise.

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7. Bloch, B.: Arch. Derm. Syph., 1929, xix., 175.

MEDICINE AND THE LAW.

The Theft of Motor-cars.

In his report for 1930 the Commissioner of Police for the Metropolis has to confess that there was a 50 per cent. increase in the number of motor cars reported stolen. It is true that he can claim that recovery quickly follows in a very large percentage of cases; out of 4941 cars stolen during the year only 182 were not recovered. But this measure of success is not completely reassuring to professional men who must rely on the reasonable safety of their means of movement. No doubt, as the report says, the cars are often taken only for pleasure rides. Here it is satisfactory that these so-called "borrowings" are now a punishable offence by virtue of Section 28 of the Road Traffic Act. The Commissioner comments somewhat naïvely on the ease with which burglars and other criminals can facilitate their operations by simply appropriating a car left standing in the street. "Greater use," he says, "should be made of garages." But is a doctor expected to leave his car in a garage every time he visits a patient? If garaging is impracticable, adds the report, drivers leaving their cars unattended should take precautions to prevent them being driven away; "professional criminals dislike work and trouble, and it is almost unknown for a car to be stolen from the street when reasonable precautions have been taken." But the Commissioner is obliged to remind us that "it may be necessary in emergency for the car to be moved by hand in the owner's absence." Indeed, in the London traffic area car-owners have been prosecuted for locking their cars; they intended to frustrate the criminal but they broke statutory regulations. The original London Traffic (Parking Places) Regulations of 1925 merely said that a driver must move a parked car if required by a constable, and that "on the occasion of any public procession or for other good and sufficient reasons or in case of emergency" a constable might move a vehicle whether or not the driver was present. Fresh regulations in 1928 directed that, if a driver left a car unattended at a parking-place, he must so leave it that it may be "moved from one position to another by manual power"; it might be so moved by a police constable in uniform "or other person authorised by such constable" for any reasonable cause in the absence of the driver. These provisions remain unaltered in the superseding regulations of 1929 now in force. It should be noticed that, in the driver's absence, the car is not to be moved otherwise than by hand; anything which makes it difficult for an unauthorised person to start the engine is therefore a legitimate precaution. It should also be noted that these regulations apply only to cars parked at the official parking-places in London scheduled to the 1929 regulations (as from time to time varied). There seems to be no law that a car left temporarily outside a patient's house must be so left that it can be moved even by manual power, though emergencies can be imagined in which such movement might be in the interests of the car-owner.

The use of the mobile squad and of wireless communication with patrols may make things harder for the car-thief. We must wait for next year's figures to see what improvement may be due to such measures. These criminal statistics for London show a serious position. Whether helped by stolen cars or not, burglaries rose from 262 in 1929 to 352 in 1930, and the breaking and entering of buildings other than houses rose from 1539 to 2191.

CORRESPONDENCE

THE CHEMOPROPHYLAXIS OF MALARIA.

To the Editor of THE LANCET.

SIR,—The gratitude of workers in tropical medicine all the world over is due to Colonel S. P. James and his co-workers, Dr. W. D. Nicol and Mr. P. G. Shute, for their convincing demonstration of the value of plasmoquine in therapeutic doses as a prophylactic against malaria infection. (THE LANCET, August 15th, p. 341). That plasmoquine* has a selective action on the sporozoites of malaria is an entirely new scientific fact and one of far-reaching importance. As one who has been actively engaged in endeavouring to assess the exact value of plasmoquine treatment in malaria subsequent to its introduction to therapeutics in 1926, this paper comes as a great encouragement.

There can be no doubt now that plasmoquine has a distinct effect upon the trophozoites of malaria in the blood, but even here, as far as my own observations go and as I have emphasised in my publications on the subject, the drug acts in a different manner to quinine. For instance, it appears to be more efficacious in extirpating the trophozoites of the benign tertian parasite than those of the quartan or subtertian. In fact in subtertian malaria the drug in full therapeutic doses of 0·06 to 0·08 g. daily appears to be unsatisfactory so that clinical and parasitic relapses have occurred in my experience whilst the patient is under treatment, as I reported in my original paper.[1] But the most remarkable effect of plasmoquine is its selective action upon the gametocytes of the malaria parasite upon which quinine (when given uncombined with plasmoquine) appears to act very slowly and with uncertainty. The crescent form, or gametocyte, of the subtertian parasite may be taken as an index of the particularly selective action of the drug which is at present unexplained. Crescents are known to persist for a long time, even for weeks, in the peripheral blood of patients when on full doses of quinine, as I reported in my second paper[2] they have been observed apparently unchanged after the ingestion of grs. 840 (56 g.) of quinine.

The peculiar action of plasmoquine on crescents was first noted by P. Mühlens[3] and later by myself it was figured in the paper just quoted. These observations have been strikingly confirmed by W. Mollow[4] who has given a coloured plate of the curious appearance assumed by these defunct gametocytes. It was thought quite naturally at that time that, in the effective destruction of gametocytes and the sterilisation of the blood resulting therefrom as a means of infecting anophelines, the chief value of plasmoquine chemoprophylaxis (to use the new term) lay.

The combination of plasmoquine with quinine sulphate as first advocated by W. Schulemann and G. Memmi[5] was a distinctive advance, especially in the treatment of subtertian malaria, for the combination with quinine enhanced the value of plasmoquine in the treatment of malaria and apparently counteracted the well-known toxic action of plasmoquine when given uncombined. I have strongly advocated the use of this combined treatment in the routine treatment of malaria in a third paper.[6] This view was then considered too optimistic, but has since received ample confirmation. It is probably true that results obtainable by "plasmoquine compound" treatment in a cool climate are not comparable with those recorded in the tropics, where the climatic and dietetic factors are a detriment to its vis medicatrix and the ultimate recovery of the patient; moreover, it is probably true too, that the initial doses of plasmoquine advocated, 0·08–0·1 g. daily, were far too large. I am now obtaining equally satisfactory results with much smaller doses, such as 0·04 g. plasmoquine daily combined with 0·5 g. quinine sulphate (grs. 7½). Some of the most gratifying results I have had have been in the treatment of malaria in pregnancy, especially in women infected with subtertian malaria where the danger to mother and fœtus is well known. The drug appears to be remarkably well tolerated, and in my experience, now of several cases, leads to the termination of a normal pregnancy and labour without relapses. I have had also satisfactory results in pregnancy with quartan and benign tertian infections and I hope soon to publish these results in extenso.

For the last three years I have advocated the use of plasmoquine compound as a prophylactic to patients returning to the tropics to malaria-infested stations, especially in Central and West Africa, and reports I have had recently from patients who have returned after a tour of service have been most satisfactory. Naturally, I have not had the opportunity of testing my observations upon a large and scientifically conducted scale. My advice has been to take one tablet of plasmoquine compound (plasmoquine 0·01 g.

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* There has been some confusion about the name and composition of this drug. We are assured by Bayer Products, Ltd., the London agent of its makers, that Plasmoquine, as now issued, is identical with the preparation in the first instance issued under the name of Beprochin. There has been no alteration in its composition. Plasmochin is simply the continental spelling of Plasmoquine. The makers state that Plasmoquine is N-diethylamino-isopentyl-8-amino-6-methoxy-quinoline, obtained synthetically. It is not derived from quinine.—ED. L.

[1] Proc. Roy. Soc. Med., 1927, 919–926.

[2] THE LANCET, 1928, i., 25.

[3] Beiheft z. Arch. f. Schiffs- und Tropen-Hyg., 1926, xxx., 305.

[4] Arch. f. Schiffs- und Tropen-Hyg., 1928, xxxii., 116.

[5] Klin Woch., 1927, vi., 1093.

[6] THE LANCET, 1928, ii.

plus quinine sulphate 0·125 g.) last thing at night on going to bed during the malaria season. It is specially important to observe that the drug should never be taken on an empty stomach.

Obviously these valuable observations of Colonel James are going to impart a new stimulus to this aspect of the subject and will probably result in the elaboration of even more satisfactory compounds of plasmoquine and in setting the true and scientific prophylaxis of malaria on a proper and practical basis.

I am, Sir, yours faithfully,

PHILIP MANSON-BAHR.

Weymouth-street, W.1, August 14th, 1931.

IMPRISONMENT FOR MENTAL DISORDER.

To the Editor of THE LANCET

SIR,—I am glad that Prof. Millais Culpin has drawn public attention to the unfortunate man who was sentenced at Hove Police-court to fourteen days' imprisonment for an offence committed when he was alleged to be suffering from loss of memory. On the day following the conviction I telephoned to the Home Office and urged that the case should be investigated. A member of the secretarial staff listened courteously to my plea and promised to look into the matter.

I cannot agree with Prof. Culpin, however, that no blame attaches to the police or the bench. Surely it is not asking too much of the magistrates to expect them to recognise that a man who genuinely fails to know his name and family is in an abnormal mental state, and that the genuineness of his amnesia and its bearing upon his criminal responsibility are matters which should be the subject of medical evidence.

I am, Sir, yours faithfully,

W. RUSSELL BRAIN.

Harley-street, W., August 17th, 1931.

THE LATE LIEUT.-COLONEL LORD.

To the Editor of THE LANCET.

SIR,—I desire the favour of a few lines in which to express the admiration I had, shared with many other members of the Royal Medico-Psychological Association, for the late Lieut.-Colonel Lord. I can speak of him as a friend and colleague in the Medico-Psychological Association and in the Council of Mental Hygiene.

An outstanding feature of his character that could not be overlooked was Colonel Lord's unbounded interest and enthusiasm in the work and welfare of the Association, which has been the means of placing our nurses and mental hospitals in the van of the civilised world. No time or trouble spent on behalf of the Association was grudged by him. A phrase of this kind is often used in complimentary addresses and appreciations, but in Colonel Lord's case it has a special meaning. He held an important post under the London County Council, and this involved a full day's work. Every evening, however, after his official duties for the day were over, he began a second day's work for the Association, and worked on till all the hours of the morning of the next day. The amount of work, mainly of a literary and organising kind, that he overtook during these undisturbed hours in the evening and the night-time, was colossal.

His official post in the Association for many years was that of editor of the *Journal of Mental Science*, itself affording enough scope for the energies of any ordinary man. He discharged the duties of this post—both from the business and scientific points of view—most efficiently, and enhanced the reputation of the journal. Some six years ago he was elected President of the Association and since then he has played an important, if not a leading, part in organising its schemes and enterprises. Nothing that was done by the Association was outwith his interest and activities. The preparation of evidence for the Royal Commission, the presentation of the views of the Association on the new Mental Treatment Act, the elaboration of a new constitution and laws for the Association, now designated Royal; these and similar operations were all influenced by his guidance. The training of mental nurses, their examinations, and their registration by the Association was one of his chief occupations, in view of the fact that their interests had been sacrificed by the General Nursing Council in favour of those of hospital nurses. A permanent memorial of his energy was the creation of the Research Committees of the Association, whereby excellent scientific work has been encouraged with success in our mental hospitals. Lastly, he was secretary and an active member of the Council of Mental Hygiene, and at the International Congress held at Washington last year, he did most useful work for Great Britain.

Colonel Lord did the work of two men, and that under very unfavourable physical conditions. His health during all these years was critical, and when he should have rested, he worked the harder. Being anxious on one occasion on account of his exhausted condition, I spoke to his niece, who then looked after his welfare, to order him to stop work. She answered sadly: "There is no living person who can get him to stop work." If ever a man died in harness, he did. Possibly he found distraction from his anxious physical condition in hard work. At all events, for years he was the most notable example known to me of a brave man struggling against adversity, refusing all compassion, and refusing to acknowledge defeat. His work over, he now rests.

I am, Sir, yours faithfully,

GEORGE M. ROBERTSON.

Edinburgh, August 16th, 1931.

EXCESSIVE SPONTANEOUS INFLATION OF A LUNG CAVITY.

To the Editor of THE LANCET.

SIR,—I read with interest Dr. Blyth Brooke's excellent account of a case diagnosed as excessive spontaneous inflation of a lung cavity (THE LANCET, August 1st, p. 240). One may note that this condition has been observed with manometric control by Dr. Vere Pearson[1] who regards it as a factor in the normal pathogenesis of pulmonary cavities. Dr. W. Mitchell[2] has also concluded that the cavities previously known as pleural rings, which he calls air cysts, are produced possibly by a check-valve action in the ulcerated wall of a bronchus or bronchiole. Such a cavity has been investigated by Dr. Andrew Morland, who informed the Tuberculosis Association last June that he had found a positive pressure in it.

Dr. Blyth Brooke remarks that the diagnosis in his case was between inflated cavity and spontaneous pneumothorax, and suggests that dullness and cavernous breathing posteriorly tend to exclude pneumothorax. However, in such a case as he describes, one would expect adhesions posteriorly to prevent a complete spontaneous pneumothorax, and these would also tend to anchor the mediastinum. Consequently, I should suppose that, judging from his account, Dr. Blyth Brooke inserted his needle either into a compressed cavity or, more probably, through lung into an anterior pneumothorax.

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[1] Brit. Med. Jour., 1930, i., 380.
[2] Brit. Jour. Radiol., 1930, iii., 446.

One would be disposed to criticise Dr. Blyth Brooke, first, in his choice of the posterior route through lung into the cavity, for there would have been no risk in using an initial needle anteriorly; secondly, in his advocacy of the introduction of pneumothorax needles through lung into dilated cavities for the relief of pain. Such a method would normally be a temporary expedient, for the check-valve mechanism would remain, and also it would occasionally cause unpleasant hæmoptysis.

Dr. Blyth Brooke suggests that "in view of the extent of toxæmia, it was considered that neither an artificial pneumothorax nor a phrenic evulsion would offer her any material assistance." Does he then regard it as *a general principle* that a patient with a unilateral lesion, who is in a very toxic state, is unsuitable for pneumothorax? Surely very careful collapse therapy is exactly what is indicated.

I am, Sir, *yours faithfully*,
H. W. ALLEN.

Bryanston-street, W., August 11th, 1931.

OSTEO-ARTHRITIS.

To the Editor of THE LANCET.

SIR,—In Dr. Philip Figdor's paper on p. 382 of your last issue, he makes the statement that this disease "attacks people who have reached the age of double dentures." I think one may infer from this that Dr. Figdor considers that such people cannot have any oral sepsis. With this point of view I cannot agree, for septic foci in completely edentulous alveolar margins are by no means uncommon, and are as much (if not more) a source of septic infection as abscessed teeth. I called attention to this in a short note in your issue of May 17th, 1930. Dr. Figdor goes on to say that "in those who have teeth, extraction of the remaining teeth seems to make very little difference." Unless these teeth were infected, I do not suppose that it would make any difference. I cannot think that trauma alone is sufficient to account for all the changes found in osteo-arthritis. Would it not be more reasonable to suppose that the trauma prepared a way for microbic action?

I am, Sir, yours faithfully,
J. D. KIDD, M.B.

Queen Anne-street, W., August 14th, 1931.

ANÆSTHESIA IN LABOUR.

To the Editor of THE LANCET.

SIR,—With reference to the communication by Dr. Jane King and Dr. Joyce Morgan on page 346 of your last issue, I have found that satisfactory results can be obtained in private practice without the use of an expensive apparatus. All that is necessary to carry is a 100-gallon cylinder of nitrous oxide. For a small cost a reducing valve can be provided for the cylinder, automatic filling valves for the bag, and a self-administering stop-cock between the bag and the facepiece. Administration can be started towards the end of the first stage. When a uterine contraction begins four deep breaths are taken from the bag, the breath being held after the last to prolong the effect of the gas. The facepiece is then laid aside until the next contraction begins. By this method analgesia is produced. Cyanosis is slight and passes with the next breath of air. An *oxygen cylinder is not required*.

Labour is not prolonged. Full anæsthesia for the birth of the head is *procured with chloroform*. In normal cases the help of an anæsthetist is not essential, the final anæsthesia being entrusted to the nurse. In abnormal cases I have the assistance of an anæsthetist. I am, Sir, yours faithfully,

JAMES RIDDELL, M.D., F.R.C.S. Edin., M.C.O.G.

Plymouth, August 16th, 1931.

LORD KNUTSFORD REMEMBRANCE FUND.

To the Editor of THE LANCET.

SIR,—A letter has been received at the London Hospital enclosing a donation of £1000 and urging that a fund should be started in remembrance of Lord Knutsford. This is but one instance of a very general desire. Many other gifts for the same purpose have already been received, as have a number of letters asking for an opportunity to contribute. We know, too, that collections by groups of workers are being made spontaneously. The committee have therefore decided to open such a fund. There were, at the moment of his death, certain very necessary additions and improvements on which Lord Knutsford had set his heart and to which he had contributed generously, but which he did not live to see completed. It is proposed to devote gifts sent in remembrance to the completion of these objectives, which include a new massage and electrical department, new stores, additional maternity beds and maintenance, and a hostel for students. Will all who wish to honour the name and work of a great man send their contributions to me at the London Hospital, E.1?

I am, Sir, yours faithfully,
EDWARD J. MANN,
August 17th, 1931. Treasurer.

BENDIEN'S WORK ON CANCER.

To the Editor of THE LANCET.

SIR,—During a visit to Zeist, Dr. Bendien has given me ample opportunity of discussing his discovery with him, of seeing him perform his tests, and of talking to and examining his patients. He does not claim to have discovered a cure for cancer, but he believes, and he is most emphatic on this point, that his method of *diagnosis* of cancer in the early and later stages are infallible. He believes carcinoma to be a local disease which can develop only if a specific alteration or, as he puts it, "specific stabilisation" of the serum is present. This abnormality of the serum he can detect by his diagnostic methods. The treatment therefore consists in restoring the *blood* to its normal condition, thus producing a *medium* unsuitable for the growth of cancer. He advises operation in operable cases; his treatment *after* operation, as shown by his serological tests prevents recurrences.

The diagnostic test consists of two parts—namely, flocculation of the serum, and spectro-photometric examination of the precipitate. The first part, the *flocculation*, which is described in your issue of May 16th, p. 1097, Dr. Bendien regards rather as a preliminary, although in experienced hands it may be *sufficient* for a diagnosis of cancer. He tells me that *in* the series of 20 test-tubes containing standard mixtures of acetic acid and sodium vanadate (1) normal human blood-serum always flocculates, if not heated, at No. 6; (2) a serum which flocculates below No. 6 indicates a pathological condition such as carcinoma or tuberculosis; and (3) the lower the number at which flocculation takes place the more concentrated is the "toxic agent" of the serum. Cases flocculating below No. 4 are of particularly bad omen; these are the cases which, according to Dr. Bendien, are inoperable, not in a technical sense, but because dissemination has already taken place, as shown by the great quantity of "toxic" material present in the serum.

The spectro-photometric test, employed for accuracy of diagnosis and as a confirmation of flocculation, is a highly technical process involving mathematical calculation. The precipitate obtained with the acetic vanadate mixture is heated to 56° C. to dissolve what Dr. Bendien calls "normal-labilin" (a protein present in all sera); it is filtered off, weighed, and suspended in $NaHCO_3$ (1 : 50). Suspensions, 20 in all, of various strengths are now submitted to spectro-photometric examination, and 20 photographs of the ultra-violet part of the spectrum are taken. The absorption lines are plotted on a chart and a curve so obtained which is typical of cancer, indicating the presence of a thermostable protein peculiar to it.

Dr. Bendien kindly gave me a full account of the methods and principles of his treatment, but it is impossible for me to go into details here. He wishes me to state that all cases so far treated were inoperable ones, generally with metastases; most of these cases had been submitted to radium, X rays, &c., without success before they came under his care. But in every case he was able with his treatment to obtain an improvement: he does not wish to make any other claim.

I am, Sir, yours faithfully,

A. A. MILLER, M.D., M.R.C.S.

Harley-street, W., August 17th, 1931.

THE SERVICES

ROYAL NAVAL MEDICAL SERVICE.

Surg. Lt. F. C. Crean to be Surg. Lt.-Comdr.

ROYAL NAVAL VOLUNTEER RESERVE.

Surg. Lts. B. W. C. Archer and H. Winstanley to be Surg. Lt.-Comdrs.

Surg. Sub-Lt. P. B. Moroney and Proby. Surg. Lt. W. R. Johnston to be Surg. Lts.

ROYAL ARMY MEDICAL CORPS.

Lt. W. A. R. Ross to be Capt. and remain secd.

The undermentioned Lts. (on prob.) are confirmed in their rank: D. A. Langhorne, C. A. de Candole, and W. B. Williams.

ARMY DENTAL CORPS.

The undermentioned Lts. (on prob.) are confirmed in their rank: S. G. Watson and G. T. Drummond.

ARMY RESERVE OF OFFICERS.

Col. A. Chopping, late R.A.M.C., having attained the age limit of liability to recall, ceases to belong to the Res. of Off.

TERRITORIAL ARMY.

Col. J. G. Martin, having attained the age limit, retires and retains his rank, with permission to wear the prescribed uniform.

Capt. G. W. Wigg from 72nd (Northumbrian) Fd. Bde., R.A., and Capt. K. J. T. Wilson (late R.A.M.C. Spec. Res.), to be Capts.

ROYAL AIR FORCE.

The undermentioned are granted permanent commissions in the ranks stated: Flight Lt. J. H. Cullinan and Flying Officers C. G. Harold and A. Sheehan.

ROYAL AIR FORCE RESERVE.

Flying Officer C. J. MacQuillan is promoted to the rank of Flight Lt.

INDIAN MEDICAL SERVICE.

Lts. to be Capts.: L. F. Burns, L. Dass, P. C. Dutta, and E. A. O'Connor.

Lt. (T.C.) A. M. H. Shirazi to be Capt. (T.C.).

The undermentioned appts. are made: to be Lts. (on prob.): E. H. Lossing, G. W. Miller, D. G. McCaully, and H. J. R. Thorne.

Lt.-Col. C. J. Stocker retires.

COLONIAL APPOINTMENTS.

The following appointments have been made by the Secretary of State for the Colonies: Dr. R. H. Davidson, M.O., and Dr. T. A. P. Wynter, Government M.O., Jamaica; and Dr. C. A. Stanley, M.O., Malay States; Dr. B. N. V. Bailey, Asst. Government M.O.H., British Guiana, has been promoted Government M.O.H.; Dr. S. G. Harrison, M.O., Gambia, has been transferred to the Gold Coast; and Dr. J. T. Smalley, M.O., Hong-Kong, has been promoted senior M.O.

INFECTIOUS DISEASE

IN ENGLAND AND WALES DURING THE WEEK ENDED AUGUST 8TH, 1931.

Notifications.—The following cases of infectious disease were notified during the week:—Small-pox, 25 (last week 26); scarlet fever, 1250; diphtheria, 759; enteric fever, 62; pneumonia, 472; puerperal fever, 41; puerperal pyrexia, 97; cerebro-spinal fever, 25; acute poliomyelitis, 8; encephalitis lethargica, 11; dysentery, 6; ophthalmia neonatorum, 109. No case of cholera, plague, or typhus fever was notified during the week.

The number of cases in the Infectious Hospitals of the London County Council on August 11th–12th was as follows: Small-pox, 46 under treatment, 2 under observation (last week 54 and 2 respectively); scarlet fever, 1159; diphtheria, 1455; enteric fever, 14; measles, 145; whooping-cough, 364; puerperal fever, 42 (plus 8 babies); encephalitis lethargica, 211; poliomyelitis, 3; "other diseases," 135. At St. Margaret's Hospital there were 11 babies (plus 5 mothers) with ophthalmia neonatorum.

Deaths.—In the aggregate of great towns, including London, there was no death from small-pox, 1 (1) from enteric fever, 12 (1) from measles, 1 (0) from scarlet fever, 15 (6) from whooping-cough, 25 (4) from diphtheria, 33 (7) from diarrhœa and enteritis under two years, and 16 (1) from influenza. The figures in parentheses are those for London itself.

Two deaths from measles were reported from Barnsley, not more than 1 from any other large town. Liverpool reported 5 deaths from whooping-cough and 4 from diphtheria. Diarrhœa was credited with 6 deaths at Birmingham, 3 at Manchester, and 2 at West Hartlepool.

The number of stillbirths notified during the week was 266 (corresponding to a rate of 46 per 1000 births) including 58 in London.

MIDDLESEX POOR-LAW HOSPITALS.—Each of these institutions has had the word "County" added to its name, with the exception of Park Royal Hospital, which will henceforth be called "The Central Middlesex County Hospital." The domestic accommodation at the West Middlesex County Hospital is to be improved at a cost of nearly £13,000.

NATIONAL BIRTH CONTROL ASSOCIATION.—The National Birth Control Council and the Birth Control Investigation Committee have amalgamated under the title of the National Birth Control Association (with which is incorporated the Birth Control Investigation Committee). Sir Thomas Horder has accepted the presidency of the Association, and Sir Humphry Rolleston, who remains chairman of the Birth Control Investigation Committee, will be vice-chairman. The committee has been for over four years investigating the general problem of birth control, as well as the merits and demerits of different methods, while the Council, which was founded last year, has been engaged mainly on work with local authorities in regard to the Ministry of Health's memorandum on birth control. It is stated that so far 35 local authorities have authorised the giving of advice on contraceptive methods. The office is at 26, Eccleston-street, London, S.W. 1.

OBITUARY

WALTER ERNEST DIXON, O.B.E., M.D., F.R.C.P.Lond., F.R.S.

Dr. W. E. Dixon died last Sunday at his home in Cambridge, and the loss will be widely felt. He long played a notable part in the work of the Cambridge medical school, and as expert adviser his exceptional knowledge and experience were freely available in the service of medicine, both national and international.

DR. W. E. DIXON.

(Photograph by J. Palmer Clarke.

The youngest son of Mr. Robert Bland Dixon, of Darlington, Walter Ernest Dixon was educated at Darlington, Dulwich, and St. Thomas's Hospital. He graduated as B.Sc. Lond. in 1891, and as M.B. five years later. After house appointments at St. Thomas's he held posts in the physiological department, and soon began to turn his mind more and more to the action of drugs. At this time pharmacology was receiving little attention or encouragement in this country, but he was granted a Salters Research Fellowship, and began to publish experiments. In due course he became professor of materia medica and pharmacology at King's *College*, but only temporarily, for he was more attracted by the opportunities for investigation offered by Cambridge. He had taken the D.P.H. there in 1898, and in 1902 he was appointed assistant to the Downing professor of medicine, receiving the honorary degree of M.A. In 1909 he became lecturer, and in 1919 reader in pharmacology, and as teacher, writer, and research worker he came to occupy a distinguished place among the pharmacologists of the world.

As a teacher he exerted a profound influence over generations of students, especially in the way of inculcating the physiological basis of therapeutics. At the outset of his Cambridge courses he captured the attention of undergraduates, and he retained it to the very end. Pharmacology became the most fascinating of studies, because Dixon, with his cynical humour, was one of the best of lecturers. So stimulating an instructor was much in demand outside his own university, while at the same time nearly every medical school in the country invited him to become an examiner. In this capacity he was often regarded with alarm, and his methods did nothing to encourage the candidates' self-conceit, but he was always fair, and even lenient in his final decision.

Dixon was a prolific writer, and contributed to Hale White's "Text-book of Materia Medica," Heffter's "Pharmacology," Allbutt's "System of Medicine," and the British Pharmaceutical Codex, to mention only a few. His "Manual of Pharmacology," which has passed through many editions, has been the avenue through which medical practitioners all over the country have approached their examination in this subject. He succeeded Cushny as the senior editor of the *Journal of Pharmacology*, and was on the editorial committee of several other scientific journals. He also served on many important commissions and committees, including that which the League of Nations set up to consider drug addiction. In this capacity he was valued not only for his authoritative knowledge but also for his faculty of singling out the essential points of a problem.

As an investigator, he made many contributions to physiology and pharmacology which covered a wide field. Among them may be mentioned his researches on apocodeine, tyramine, histamine, and digitalis, on general problems of pharmacology, especially tolerance and site of action of drugs; but of chief importance was his pioneer work on the physiology and pharmacology of the bronchial muscle and on the cerebro-spinal fluid. In all his researches he brought to bear a fearless and original mind, never afraid to question tenets apparently established, and he devised many improvements in pharmacological technique. He had, moreover, the faculty of gathering young men around him and interesting them in research work. He was full of ideas, often heterodox, and many of his old pupils, who now occupy important teaching positions, would willingly acknowledge his help, guidance, and inspiration.

Dr. O. Inchley, lecturer on pharmacology at King's College, London, writes: "On the title page of his 'Manual of Pharmacology' appears a quotation from Renan, 'Dire n'est rien; faire est tout,' which, to me, gives the keynote of Dixon's life-work. Not long ago the assertion of physicians as to the beneficial action of this or that drug in this or that disease was taken on faith. To-day the actions of drugs are determined physiologically by experimental methods, and in the birth of this modern science of pharmacology Dixon took an outstanding position. His manual contains liberal illustrations of kymograph tracings, each in itself an accurate experimental record and supplying the student with facts rather than opinions. The simple experiments suitable for class work set out in his 'Practical Pharmacology' convince the student, *by his own observation*, of the action of the drug on the animal. Dixon's lectures were never stodgy. His personality insured that whatever he touched was raised from the commonplace. We, who knew him intimately, knew that whenever he was with us we should never be bored. Dixon at the dinner table, Dixon on a walking tour, or Dixon on a rock scramble in Sark was the leader, life, and soul of the party. His wit was sprightly and never cruel. He excelled as a raconteur, and some of his most amusing tales were against himself."

"The subject of pharmacology," writes Prof. J. A. Gunn, "has suffered grievous losses in the last few years—Cushny, Magnus, Loevenhart, Trendelenburg, and now Dixon, all men in the front rank, and all, one hoped, with fruitful years of work still before them. For one who has enjoyed an uninterrupted friendship with Dixon for over a quarter of a century, and who has experienced nothing but kindness and encouragement from him, it is difficult at present to write any coherent appreciation of his work. He had come to be accepted, since Cushny's death, as the leader of academic pharmacology in this country, and his loss, when we have so few pharmacologists, and indeed few medical men with his wide training and outlook, is in the meantime irreparable. No one who knew him will forget his arresting personality. A wide and unusual knowledge of men and things, a gift for telling stories, an infectious and almost boyish enthusiasm, made him a delightful and resourceful companion."

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At the time of his death Dr. Dixon was 60 years of age. He married in 1907 the only daughter of the late Mr. Francis Glen-Allan, of Dulwich, and their house at Whittlesford was known for its generous hospitality.

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Martin William Flack, the son of Mr. E. C. Flack, of Borden, Kent, was born in 1882, and received his early education at the Great Yarmouth and Maidstone Grammar Schools. He proceeded to Keble College, Oxford, with a science exhibition, and took up the study of medicine, coming under the influence of such potent teachers as the late Prof. Gotch, Prof. Arthur Thomson, and Prof. J. S. Haldane. He graduated in Arts at Oxford in 1905, and completed his medical education at the London Hospital, where he held a scholarship. While at the London Hospital he was associated with Sir Arthur Keith in an investigation into the nerve-muscle structure of the heart,[1] and he also carried out, in collaboration with Sir Leonard Hill, a preliminary inquiry into the physiology of respiration. He graduated in medicine at Oxford in 1909, and was elected to a Radcliffe Travelling Fellowship. In accordance with the terms of the Fellowship he spent a year on the continent, mainly continuing his study of respiratory physiology, and on his return to England became assistant to Sir Leonard Hill, who was holding the chair of physiology in London University at the London Hospital Medical College. Flack was appointed lecturer in physiology and chemical pathology at the college, and later was associated with Hill's work at the Medical Research Council in the department of applied physiology. It was with these credentials that he came to the notice of the Air Ministry, who in the early days of the war were instituting a department of medical research specially directed to the elucidation of the problems of aviation as they affected the personnel of the Service.

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From the beginning Flack proved an unqualified success in a new and difficult appointment. He was saturated with the kind of knowledge whose application was most desirable, and had that knowledge wonderfully well sorted, for he had been a successful teacher of physiology, and was actually in the middle of writing a text-book with Sir Leonard Hill on the subject when the war broke out. He had assisted in valuable demonstrations of practical pathology, much of which bore directly upon the very questions which the new department would have to answer. His personal researches into important phenomena of the physiology of heart and respiration were exactly of the sort to stand him in good stead in devising tests which would assist in the recruiting of the candidates for the service. The report for 1920 of the Royal Air Force may be called in evidence for these statements. It contained a section describing a Medical Board for aviation candidates which showed how thoroughly Flack and his willing collaborators had faced the devising of a course of training and a method of inspection and examination which should result in securing the right men for a dangerous service—in essence the procedure was directed to removing, as far as possible, the element of danger. The result of this work was to make it necessary for the candidate to pass a medical examination to prove physical fitness, to provide evidence of good personal history, and to emerge successfully from a physiological assessment, based upon tests of the cardiac, respiratory, and nervous systems. An anthropometric index of physical fitness was devised, and standards were laid down which, though not unduly high, would lead to the inevitable rejection of recruits whose acceptance would be cruelty to themselves and dangerous to their colleagues. The first Director of Medical Research in the Royal Air Force Medical Service died while still holding the appointment which he was so adapted to fill and develop. He had borne a long illness in the Air Force Hospital at Halton before the end came in his fiftieth year. The Air Force owes him an inextinguishable debt.

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THE death of Dr. Shepherd Boyd, of Harrogate, on August 8th, will be regretted by many whom he befriended and many who appreciated his unusual charm. Seventy-five years of age, he was the son of Dr. John William Boyd, once the oldest doctor in Ireland, who died at the bedside of a patient after 57 years of practice from one house. After attending Kilkenny College and Devon County School the son went to Trinity College, and distinguished himself as one of the best oarsmen Dublin has produced. Twice he reached the final of the Diamond Sculls at Henley, and in other branches of athletics his achievements were sound, if not so brilliant. He qualified in 1880, became F.R.C.S. Irel. three years later, and saw many different sides of life as practitioner in his home town of New Ross, medical officer of Cork-street Fever Hospital during a small-pox epidemic, ship's surgeon on the Nile, resident at Manchester Maternity Hospital and Chelsea Dispensary, and surgeon to a mining company in Yorkshire and an ironworks in Wales. He practised in Manchester for some years, moved to Bexhill, and finally settled at Harrogate some 27 years ago. But his life as a spa practitioner was yet to be interrupted by the war. From youth onwards an enthusiastic volunteer and territorial, he was well "over age" on the outbreak of war, but nevertheless got to France and remained there until after the Armistice. During an air-raid in Boulogne his hearing was badly damaged, but in spite of this disability he joined an ambulance train in 1918 and survived an almost direct hit by a bomb at Étaples. Deafness, largely, if not entirely due to this war service, was a serious trial during the latter part of his life, and he had to contend with other illness. "But," writes a colleague, "he presented a picture of triumphant personality dominating by its own inherent strength the lesser tragedies that might well have daunted a lesser man. . . . He was marked out by an extraordinary kindness of nature, and no trouble was too great for him to take to help anyone who appealed for his sympathy or his aid. Coupled with this kindly nature was a sparkling and irrepressible gaiety of spirits." He was especially encouraging and helpful in his treatment of recently qualified members of the profession.

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[1] THE LANCET, 1906, ii., 359.

Dr. Shepherd Boyd was long associated with the Irish Medical Schools and Graduates Association, and the Association of British Postal Medical Officers, and was at one time president of the Harrogate Medical Society. His wife survives him, and a son.

Dr. WILLIAM BURNS, who died on August 4th whilst attending a patient in the dispensary at Glengall-street, Belfast, was a student of Queen's College, qualifying at Glasgow in 1901. He then volunteered for special plague duty in India, returning after two years to take up general practice in Belfast. In 1910 he took the D.P.H. Belf., with a view to appointment as part-time medical officer of health for the urban district. Dr. Burns is described by a colleague as one whose joy in life endeared him to his colleagues, while his devotion and skill produced a host of patients who regarded him not only as their medical adviser, but as a friend to whom they could bring all their difficulties. Thousands of persons lined the route when his body was laid to rest amid the beautiful surroundings of Knockbreda. Dr. Burns was in his sixty-first year.

MEDICAL PRACTICE IN CHINA.—It is announced that foreign medical practitioners wishing to practise in China should forward their examination diploma and any other documents attesting their qualifications to the nearest consul of their nationality for his inspection, with a request that he issue a certificate. When this certificate has been obtained, it should be forwarded, together with a statement of the applicant's record, two 2-in. half-figure photographs, a registration fee of five dollars, and a stamp-tax fee of two dollars, to the appropriate local government department (i.e., the health bureau, or, if the district has no health bureau, then the Public Safety Bureau or the district government) for transmission to the health section of the Ministry of the Interior.

MEDICAL NEWS

THE annual general meeting of the Medical Sickness Annuity and Life Assurance Society Ltd., will be held at the First Avenue Hotel, High Holborn, London, W.C., on Wednesday, Oct. 7th, at 4.30 P.M.

London Hospital Saturday Fund.

The annual street collections for this fund will be held *on Sept. 26th.*

University of Manchester.

The Prof. Tom Jones Memorial Fellowship in Surgery has been awarded to Dr. A. L. Kenyon.

St. Mary's Hospital Dinner.

The annual dinner of past and present students will be held at the Trocadero Restaurant, London, W., on Friday Oct. 2nd, at 7 for 7.30 P.M. Sir William Willcox will preside.

Royal Sanitary Institute.

Lord Leconfield, *Lord Lieutenant* of Sussex, and chairman of the West Sussex County Council, has consented to act as president of the forty-third congress of the Institute, to be held at Brighton from July 9th to 16th, 1932.

Post-graduate Courses in Berlin.

From Oct. 5th onwards a number of international post-graduate courses will be held in Berlin on general and special subjects. The latter include pædiatrics, urology, medical psychology, intrathoracic surgery, and physical and dietetic treatment. In the spring there will be further courses on radiology, surgery, obstetrics, industrial medicine, and ophthalmology. Particulars may be had from the information bureau of the Kaiserin Friedrich-Haus, Luisenplatz 2, *Berlin*, N.W. 6.

Manchester Radium Institute.

Dr. Ralston Paterson has been appointed director of the Manchester Radium Institute in succession to the late Dr. A. E. Birkett. He will also be director of the national radium centre at Manchester, and will superintend the use of radium lent by the Radium Trust to the Royal Infirmary and the Institute. Dr. Paterson, who is at present working at the Edinburgh Royal Infirmary, has lately spent four years in the United States and Canada, and has made an extensive study of radiological methods there employed.

Congress of Tropical Medicine.

The second International Congress of Tropical Medicine will be held at Amsterdam from Sept. 12th to 17th, 1932, under the presidency of Prof. G. Grijns. The subjects of discussion will be (1) avitaminoses, with special reference to beri-beri; (2) yellow fever and leptospiroses; (3) helminths, with special reference to ancylostoma; and (4) malaria, with special reference to blackwater fever. Those wishing to participate in the Congress are asked to inform the general secretary (Prof. E. P. Snijders, Institute of Tropical Hygiene, Mauritskade, 57, Amsterdam) before *the end of this year.*

Fellowship of Medicine and Post-Graduate Medical Association.

The following are the subjects of special courses to be held in September: diseases of the chest at the Brompton *Hospital, from* Sept. 7th to 12th (all day); psychological medicine, at the Bethlem Royal Hospital, from Sept. 8th to Oct. 3rd (Tuesdays and Saturdays at 11 A.M.); diseases of infants, at the Infants' Hospital, from Sept. 14th to 20th (every afternoon); ophthalmology, at the Central London Ophthalmic Hospital, from Sept. 8th to Oct. 3rd (every afternoon); and medicine, surgery, and the special departments, at the Westminster Hospital, from Sept. 14th to 20th (all day, men only). Syllabuses of these courses may be had from the secretary of the Fellowship at 1, Wimpole-street, London, W.1. A series of free lectures on Prognosis will begin early in October, and also the usual series of free demonstrations in medicine and surgery—one a week in each subject at different hospitals.

THE LANCET: SUBSCRIPTION RATES.

		£	s.	d.
INLAND	One Year	£2	2	0
	Six Months	1	1	0
	Three Months	0	10	6
ABROAD	One Year	2	10	0
	Six Months	1	5	0
	Three Months	0	12	6

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NOTES, COMMENTS, AND ABSTRACTS

HOSPITALS AND MOTORING ACCIDENTS.

RECOVERY OF EXPENSES OF TREATMENT.

A MEMORANDUM[1] has been prepared by a barrister for the Central Bureau of Hospital Information explaining in non-technical language the effect of Section 36 (2) of the Road Traffic Act, 1930, in so far as it gives hospitals a claim on insurance companies for the expenses of treatment in hospital of the victims of motor accidents. The memorandum also deals with certain difficulties that have arisen in practice under the Act, and contains the answers to a number of inquiries that have been received.

It must be realised that Section 36 (2) of the Road Traffic Act is intentionally restricted in its effect, and that, large as is the number of victims of motor accidents who are treated in hospitals every year, insurance companies will only have to make payments to hospitals in respect of such treatment in a very small proportion of cases. This proportion is, in fact, estimated to be about 10 per cent.

HOSPITALS ENTITLED TO PAYMENT.

Payment for the expenses of treatment of victims of motor accidents can be claimed by any hospital that is "an institution which provides medical or surgical treatment for in-patients." The question has been raised whether this definition includes a hospital where it is usual only to provide nursing and accommodation, leaving the patients to arrange with their own doctors to attend them. The answer is that, so long as there is any medical staff who would ordinarily deal with emergency cases, the hospital comes within the definition. In the rare case where there is no such staff, the answer will depend on the judicial interpretation of the words "medical or surgical treatment"; in the meantime it is recommended that claims should be put in against insurance companies in all such cases.

CONDITIONS UNDER WHICH CLAIM CAN BE MADE.

The right of a hospital to obtain a payment from an insurance company for the expenses of treatment of the victim of a motor accident depends on the following conditions being fulfilled:—

(*a*) The victim must, as a general rule, be either (i) a person who was not in the car that was responsible for the accident, or (ii) a person who was a paying passenger in the car.

(*b*) The insurance company must have made a payment to the victim or his dependents in respect of his personal injury or death.

(*c*) The victim must have received treatment in the hospital as an in-patient.

(*d*) The hospital must not have made any charge in respect of the victim's treatment.

Even when all these conditions *are* fulfilled, the hospital will not *necessarily* be entitled to a payment from an insurance company. These conditions are merely the sine qua non for any such payment.

VICTIMS IN RESPECT OF WHOM CLAIM CAN BE MADE.

It is only in respect of a very restricted class of victims that the expenses of treatment can be recovered by hospitals from insurance companies. The owner or driver of the car responsible for the accident will never come within the class. The car owner's friends or employees, being driven in the car, will come within this class when the policy has been specially so drawn as to include them, but not otherwise. If it is possible for the hospital secretary to see the policy issued by the insurance company in any particular case, he will be able to satisfy himself as to the exact classes of persons covered by the policy.

"A person not in the car that was responsible for the accident" of course includes any person in any *other* car that is involved in the same accident, as well as a pedestrian, a rider, &c. The question of responsibility for an accident is often most difficult to decide, especially when more than one car is involved in it, but fortunately, hospitals need not concern themselves with this point, as it will be decided for them. As, however, it will always be difficult for a hospital to know whether it has a good claim for the expenses of treatment of each individual patient, it is recommended that notice should be given to insurance companies concerned of every victim of a motor accident that is admitted to the hospital.

CASES IN WHICH HOSPITALS HAVE NO CLAIM.

In the following cases the victim will receive no payment from an insurance company, and consequently the hospital will not be entitled to any payment from the insurance company for the expenses of the victim's treatment.

(*a*) If the driver or owner of the car responsible for the accident is himself killed, or dies before his victim obtains a judgment for damages against him, or before his claim is otherwise settled.

(*b*) If the victim of the accident dies before his claim is decided, and he leaves no dependents who are entitled to claim damages for his death.

(*c*) When the accident has been caused by an uninsured person in a stolen car, or in a car he is not authorised to use.

(*d*) When the accident has been caused by a car owned by a local authority or a police authority, by an invalid carriage—i.e., specially designed for use by a person suffering from a physical disability—or by a tram car or trolley vehicle the use of which is authorised by special Act of Parliament or Order

PAYMENT BY INSURANCE COMPANY TO VICTIM OR DEPENDENTS.

Is it necessary to prove the negligence of the car driver before the hospital can recover a payment from the insurance company? The answer is that *the hospital* is not concerned with any question of negligence, but must merely ascertain whether any payment to the victim or his dependents has in fact been made by the insurance company under its policy; if such a payment has been made, then the insurance company must also make a payment to the hospital in respect of that victim's treatment. In point of fact the insurance company will only make this payment to the victim either (i) if it is agreed, or has been decided in court, that the car owner or driver insured by this company was responsible for the accident, or (ii) if responsibility is not proved or admitted, but the insurance company, in order to avoid legal proceedings, makes a payment to the victim by way of a compromise of his claim —called a "compassionate grant."

As the recovery by hospitals of expenses of treatment from insurance companies depends on the victim having actually received some payment in respect of his injury, it may possibly be worth the while of hospitals to consider whether they could obtain the honorary services of a local solicitor to look into the claims of victims (being patients in hospital) who either neglect, or have not the means, to take the necessary steps for pressing their claims themselves.

EXPENSES OF TREATMENT THAT CAN BE RECOVERED.

The claim of a hospital against an insurance company is limited to £25 for each patient. Subject to this, the hospital can claim, at the rate of the average cost of an occupied bed per day, for the number of days that the victim has been treated as an in-patient. The average cost of an occupied bed per day is arrived at by taking the hospital's total annual expenditure on the maintenance of the hospital and its staff, and on the maintenance and treatment of patients, and dividing this figure by the total of daily counts of in-patients.

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[1] Copies on application to the Director of the Bureau, 12, Grosvenor Crescent, London, S.W. 1. 3*d*. post free.

Claims for payment can only be made in respect of in-patient treatment. No extra payment can be claimed for an operation or for any special form of treatment. There appears to be an idea that the Act would allow a hospital to pay its medical staff special fees for attending motor-accident patients, and to increase the costs to be recovered from an insurance company by the amount of such fees. It is quite clear that the Act does not allow of this being done. The costs per day to be recovered for a motor-accident patient must be the same as the average cost for *all* the patients in the hospital.

CHARGES MADE BY A HOSPITAL FOR TREATMENT.

The condition that "the hospital must not have made any charge in respect of the victim's treatment" gives rise to several difficulties, and raises the question as to what payments hospitals can receive from victims without losing their claim against insurance companies.

(*a*) *Voluntary payments by victim.*—It seems clear that a purely voluntary payment by a victim to the hospital cannot legally prejudice the hospital's claim for a subsequent payment from the insurance company. Whether it is quite fair to insurance companies that hospitals should receive both payments is another matter, and this question might well be considered when some general agreement between hospitals and insurance companies is being negotiated.

(*b*) *Invitation to pay part of cost of treatment.*—In hospitals where the usual practice is to invite patients to make such payment as they are able towards the expenses of their treatment, the question has been raised whether the acceptance of such a payment from the victim of a motor accident could be considered as "making a charge." Although the matter is not free from doubt, it is thought that such a payment may safely be treated as a voluntary payment; but care should be taken that the payment is expressly made as a "donation."

(*c*) *Practical difficulty of deciding whether to make a charge or not.*—When it is the practice in a hospital to make a definite charge to a patient of what it is thought he can pay, it is now difficult to decide how to proceed in motor accident cases.

The hospital is in a dilemma; if it makes any charge to the victim while he is in hospital, it loses its claim for a payment by the insurance company—and this payment *might* be considerably more than the victim could pay; but if it makes no charge for treatment while the victim is in hospital, and if, after the victim has left, it turns out that the hospital has no claim against the insurance company, then it will probably be too late to recover anything from the victim.

There appears to be no way out of this difficulty at present, and it can only be solved by some general agreement with insurance companies. One suggestion, which appears to be an equitable solution, is that the hospital should obtain what payment it can from the victim while he is in hospital, and deduct the amount of this payment from its claim against the insurance company. Hospitals might perhaps endeavour to come to an agreement with insurance companies on these lines in individual cases, pending the negotiation of a general agreement.

(*d*) *Payments to hospitals under certain contributory schemes.*—If the victim of an accident is treated in hospital, and the hospital claims a payment for such treatment out of the funds of a contributory scheme to which the victim subscribes, the question has been raised whether this claim must be considered as a "charge for treatment," and so preclude the hospital from obtaining a further payment from the insurance company. This again appears to be a subject on which some general agreement with insurance companies should be reached.

METHODS OF EVASION.

Some insurance companies are attempting to evade part of their liability under the Road Traffic Act. In some cases, an insurance company, before settling the victim's claim, has tried to bargain with a hospital as to its claim for expenses of treatment, and to persuade the hospital to accept less than the full amount to which it is entitled. Insurance companies have no right to do this, as the method of calculation of what they must pay to hospitals is clearly stated in the Act. In other cases, an insurance company has agreed to pay a definite sum to the victim under the policy, and has subsequently deducted from this sum the amount of the payment made by the insurance company to the hospital. Strictly speaking, this does not concern hospitals. The matter must be settled between the insurance companies and the victims. In other cases the insurance company announces to the hospital that it is proposing to make an ex gratia grant to the victim, but will only make the grant if the hospital undertakes not to demand any payment from the insurance company for the expenses of the victim's treatment. Such a threat by the insurance company is most improper.

The practical difficulty in all these cases is that if hospitals stand on their legal rights, it will probably result in insurance companies being less generous in the settlement of the claims of victims; and if this becomes apparent, it will obviously have the effect of raising a prejudice against hospitals, as it will be said that the hospitals are receiving payments which ought to have been made to the injured. Probably the only satisfactory method of settling these questions will be by a general agreement with insurance companies.

PROCEDURE IN MAKING CLAIMS.

Whenever the victim of a motor accident is brought to a hospital, information should at once be obtained from the police as to the registration numbers of all cars involved in the accident, the names of their owners, and the insurance companies by whom they are insured against third-party risks. A notice should then be sent to the insurance company—or to each insurance company, if more than one car is involved. As soon as the victim leaves hospital, or, if he has to stay in hospital for a long time, as soon as the expenses of his treatment (calculated at the average daily cost of an occupied bed in that hospital) amount to £25, a formal claim for the expenses of treatment should be sent to the insurance company. The memorandum suggests the phrasing of these notices of claim.

ALCOHOLIC CRAVING.

IN the course of a paper on the Alcohol Habit, read to the Paddington Medical Society on August 11th, Dr. ALEX. BALDIE discussed the nature of the craving for alcohol, which was bound up with that of the craving for all drugs of a habit-forming tendency. Its causes might, he thought, be fairly if briefly summarised as follows:—

ITS CAUSES.

(1) The chemical influence exerted by the drug on metabolism—an influence for good or ill which is liable to become more specific and indispensable as tolerance is established.

(2) The conscious contrast between the cerebral relaxation induced by alcohol and the emotional release consequent on such relaxation, and the mental lassitude experienced when the effect of the drug has passed.

(3) Automatism. Repetitive acts, whether whistling, humming a tune, scratching the head, biting the nails, interminably lighting and puffing a cigarette, or calling for drinks, all equally act as diversions to a mind preoccupied. An act repeated becomes a habit, the habit a vice, and the vice a destiny.

(4) Misinterpretation of natural thirst and fatigue.

To describe the nature of the habit in other words he quoted Trotter ("Instincts of the Herd in Peace and War"): "Almost universally regarded as either, on the one hand, a sin or vice, or, on the other hand, as a disease, there can be little doubt that in fact (the alcohol habit) is essentially a response to a psychological necessity. In the tragic conflict between what he has been taught to desire and what he is allowed to get man has found in alcohol a sinister but effective peacemaker . . . . a way out of the prison house of reality."

This escape from reality—that is, from emotional and intellectual tension—or relaxation, is an easy process normally for a good many people. We all know the fortunate ones who are able at will to relax either into slumber, as for 40 winks in an armchair, or into gaiety and irresponsibility after strenuous mental work. This process, easy and habitual to a favoured few, is impossible without the aid of narcotics to the vast majority of mankind. Hence the desire for such aid, and—too often—for its immoderate use. Hence also the misunderstandings and the differences of opinion as to the necessity for its use, and the irritation engendered by propaganda and legislation directed towards its restriction.

FATIGUE A CONTRIBUTORY FACTOR.

Alcoholics tire easily, as do other debilitated persons. Periodic rest at short intervals tends to prevent the sense of fatigue which is a contributory element in the craving to which they are subject. Even in normal civilised persons the sleep function is sufficiently abused. A continuous period of 16 hours of wakeful activity in the perpendicular attitude, followed by habitual slumber for eight hours in the horizontal, does not appear physiologically the most desirable habit. It has no parallel amongst the mammals at any rate. The tired nervous system of the chronic alcoholic responds quickly to a recuperative régime—such as, for workers, a short diversion and physical relaxation every two or three hours. This need not be for more than about ten minutes. It should be accompanied by the regular drinking of a variable quantity of liquid. Also complete relaxation for about an hour, after the mid-day meal, should be encouraged. It is unfortunate that the conditions of modern life, which provide abundant toilet facilities in public places, and opportunities everywhere for exercise, recreation, and refreshment, should provide none for rest; so that an individual miles away from his home, as many are compelled by reason of their occupation to be, cannot obtain rest and privacy, short of the somewhat expensive and eccentric process of taking a room in a hotel for an hour. Lucky are those exceptional persons who are able, at will, to steal 40 winks in a crowded tube train or on a hard seat in Trafalgar-square. The facilities afforded in this respect until recently by the silent film have been considerably curtailed by the advent of the "talkies."

ITS REDUCTION.

No treatment of chronic alcoholism can be effective which does not include a deliberate attempt to strengthen the will of the patient to discard the drug and to understand and undermine the potency of the craving which is his besetting sin, vice, and disease. This is the part of the treatment which is difficult and complex since it must be approached on special psychotherapeutic lines; but here, as in other directions, the family doctor, by virtue of his intimate knowledge of him, may be able to guide and control his patient's diseased tendency. The craving may not necessarily be simple in its origin—few cravings are—but an understanding of possible causes may suggest a simple and practical method of treatment.

(1) The craving may be due in part to the established and specialised influence on metabolism which we know alcohol possesses. To this extent its replacement by other forms of fuel, such as sugar, may be of use.

(2) The unrelieved overactivity of the higher mental faculties, from the strain of which alcohol has provided an habitual escape, must be avoided and another escape discovered. In other words, outlets for the expression of repressed emotion should be cultivated, in the form of recreations, interests, and pursuits most adapted to the physical and psychological personality with which we have to deal.

(3) The alternations of high and low blood pressure induced by the alcoholic transformation should be borne in mind. Generally depression and despair go with a low blood pressure; energetic and high-spirited optimism with a high. It is in its effects in this direction that exercise and occupation, not fatiguing and preferably of some useful, interesting, and remunerative kind, is indicated.

(4) The not unimportant influence of the repetitive and automatic nature of the drinking ritual requires attention. The mental preliminaries to "another little drink" may be active against the conscious will and knowledge of the patient, who must be alert to understand his unconscious tendencies and to break the repetitive chain. "Substitution" habits may be objectionable, but may help.

(5) Misinterpretation of simple thirst will be avoided if the patient assuages his natural thirst periodically with small doses of aqua pura. Misinterpretation of fatigue will be prevented by periodic rest.

ITS PREVENTION.

The majority of civilised mankind, said Dr. Baldie, uses alcohol moderately and with benefit. But the considerable minority who through idiosyncrasy, foolishness, or excess is unable to consume it safely or beneficially requires something more than exhortations and threats if it is to be influenced. Probably there is scope for yet another "temperance" society, which shall be free from all ulterior motive, and which will help ignorant persons to understand the pros and cons of alcoholic indulgence, and to know how, when, and where to stop. The following suggestions for the rational indulgence in alcoholic liquors might be of help to such a society:—

(1) Drinks should be avoided invariably between meals.

(2) They should not as a rule be used to assuage excessive thirst.

(3) They should be avoided generally during mental or physical exertion.

(4) They should be avoided absolutely under all conditions requiring the exercise of skill, judgment, and technical or mechanical efficiency.

(5) All non-teetotallers should imbibe by the clock small quantities of fresh water, since some part of the alcoholic craving is unconsciously due to natural thirst, and natural thirst is not to be assuaged by anything but pure water.

(6) The wheat should never be mixed with the grape, the use of spirits should be restricted to meal times, of beer to that of a beverage under normal mental and physical conditions, and wines to social occasions when it is desired to relax the psycho-motor inhibitions.

(7) Solitary indulgence on social and psychological grounds should be discouraged as tending to cause secret drinking and tippling.

(8) As corollary to (7) all bona fide social reformers should encourage the revival and extension of facilities for legitimate indulgence in restaurants, theatres, and other such places, devoted to the alimentary, social, and recreational requirements of the public.

Present Incidence of Alcoholism.

As a matter of historical fact it would appear that alcohol reaches its greatest popularity and use in times of stability and prosperity. Clinical experiences suggests (1) that the general incidence of alcoholism is slightly less than formerly, though not to the extent represented by some propagandists; (2) that the habitual use of alcohol is diminishing to a greater extent; and (3) that the social offence of drunkenness—i.e., inebriation of a disorderly or incapable type—has declined considerably.

FACTORS OF DIMINUTION.

The factors of diminished habitual alcoholism may be tabulated as follows:—

(1) Lessened popularity. Owing to increased mental tension, a relatively short period of exhilaration

or relaxation is produced by alcohol in the present as compared with the Victorian non-addicted population. The tendency in the case of the present generation is to experience more intensely the irritability, discomfort, and confusion of the second stage of inebriation; there is on this account, and to this extent, less habitual drinking. On the other hand, in times of stress and change, mental conflict becomes more intense and universal. This and other factors have widened the range of susceptibility to alcohol, and its use has remained almost as general, though it is relatively less habitual than formerly.

(2) The heavy and prohibitive taxation of alcoholic beverages and other restrictions.

(3) The shorter hours of work and the higher standard of living enjoyed now by that section of the public from which the statistics of old-time police-court drunkenness were drawn.

(4) Increased facilities for young persons for amusements, games, recreation, and adventure—the last being a very important item.

(5) A loosening of conventional restraint between the sexes, and the outlet provided by the freer intercourse thus possible.

(6) The extension of education, and of knowledge concerning the disadvantages of alcoholic excess.

FACTORS OF PERSISTENCE.

The factors which combine to cause the persistence of habitual alcoholism of a morbid degree are:—

(1) Group pessimism and restlessness, due to insecurity and conflict caused by (*a*) economic difficulties—e.g., unemployment, high taxation, &c.—(*b*) the disturbance of social and moral outlook, particularly in sexual and religious spheres.

(2) The encouragement of habits of secrecy and excess through indulgence according to opportunity rather than to necessity, caused by the restriction of hours and places in which alcohol may be openly sold and consumed.

(3) The relatively large increase in drinking amongst women, consequent upon the greater independence and freedom exercised by the sex.

(4) The absence, in Great Britain and Ireland, of amenities such as music and dancing, and of facilities for the use of alcohol socially, in public and with meals, such as abound elsewhere.

(5) The group urge towards individual discipline, sacrifice, and sustained and urgent effort.

(6) The increasing organisation of local transport and movement in the body social and economic, without adequate provision for physiological rest and privacy for the individual.

(7) The inability of most persons to relax at will.

(8) The biological necessity or craving for play and other escapes from reality, and the inadequacy of modern life to provide such escapes.

(9) The social, moral, and political antagonisms which are produced by all biological deprivations compulsorily applied, reasonably or unreasonably, by the group to its members.

THE WATER OF SWIMMING BATHS.

THE outdoor bather in Switzerland is fortunate in having the choice of abundant clean water in many natural lakes. Where he is thrown back on the swimming pool he is faced with the dangers that are now pretty well recognised in this country. A recent writer in the *Gazette de Lausanne* remarks that the tanks of popular swimming baths contain "a veritable purée of bacteria," the numbers of which may reach 40,000 colon bacilli and 130,000 other germs per cubic centimetre. He insists on the special danger of such water to the conjunctiva of the diver and of the exponent of the crawl and other modern strokes involving repeated immersion of the head, as evidenced by the acute follicular conjunctivitis which is peculiar to frequenters of swimming baths, and which appears after six to ten days incubation. The pathogenic agent of this disease is a filter-passing virus, and the clinical and histological aspect of the malady resembles that of trachoma. Although it may last for two to three months the affection however is not serious. The nasopharyngeal mucosa is also often affected by the polluted water of swimming baths. One observer has published statistics of 90 cases of otitis, tonsillitis, rhinitis, laryngitis, pseudo-membranous anginas, and furunculosis of the external meatus, all observed 24–36 hours after swimming in a bath. Another has recorded, in three years, a dozen cases of otitis in "crawlers."

The causes of these dangers are not far to seek, but the writers of this article and of another in the *Feuilles d'Hygiène et de Médecine*, which appears to have inspired it, do not seem to be aware of the success which has been obtained by filtration, followed by chlorination. It is very properly pointed out that filtration is insufficient, and that the sediment consisting largely of desquamated epidermis containing billions of bacteria per cubic millimetre requires a strong dose of chlorine to sterilise it. The plan of removing easily filtrable and coagulable matters and then chlorinating is not discussed. Until a preliminary cleansing with soap and brush can be insisted upon in public as it is in some private baths, the author advises swimmers not to dive or practise strokes *tête dans l'eau*. Finally, the sound advice is given not to confound cleanliness and sport, to wash in washing baths, and when clean to swim in swimming baths. One might have hoped such advice would be redundant, but even in England one has seen rather dirty boys in swimming baths. In the United States of America catchy slogans have been used with some effect.

THE PURPOSE OF AN EXPERIMENT.

A MEDICAL man, who is a director of the Scottish Society for Prevention of Cruelty to Animals, has called our attention to an advertisement which has appeared several times lately in the *Scotsman*, sent by the hon. secretary of an anti-vivisection society, and quoting from THE LANCET of May 24th, 1930 (p. 1120), the following experiment performed by Dr. G. W. Theobald in the course of work on the nature of eclampsia.

> "Bitch, near term; 45 c.cm. of a 4 per cent. solution of potassium oxalate were injected intravenously in three doses of 10, 15, and 20 c.cm. between Jan. 7th and 10th, 1920. The anus was closed on the 9th and the bitch was put on a meat diet. On Jan. 11th the animal refused food; on the 12th it reeled around as if drunk, and on the 13th it went into convulsions. The back was extended, the eyes remained open, and there was a marked tremor of the limbs. The bitch died after the convulsions had lasted one hour and before the pups were born."

The advertisement invites readers to help to stop cruel experiments by subscribing to the funds of the Society. No direct comment is made on the particular experiment, but a reader who saw the advertisement wrote to the *Scotsman* to say: "I regard anti-vivisection as a wrong fad which stands in the way of scientific progress . . . but I cannot see the lesson to be gained from the class of experiment" quoted from THE LANCET. We have asked Dr. Theobald to set out in a few sentences what the experiment was devised to prove, and he replies: "True eclampsia has never been known to occur in a dog. The object of the experiment was to cause intestinal stasis by mechanical means and to lower the blood calcium by the best known non-operative method—i.e., by the injection of potassium or sodium oxalate. The clinical symptoms produced were indistinguishable from eclampsia, and could be relieved by the intravenous injection of calcium chloride." Dr. Theobald adds that the spectacle of a women suffering from eclampsia and the suffering she endures are appalling.

Corrigendum.—The analysis of the death-rate from diabetes mellitus in the United States, annotated in our issue of August 15th (p. 364), appeared in the Statistical Bulletin of the Metropolitan Life Insurance Co. of New York.

STUDENTS' GUIDE—SESSION 1931-1932

THE GENERAL MEDICAL COUNCIL.

POWERS, DUTIES, AND CONSTITUTION.

THE General Council of Medical Education and Registration of the United Kingdom is, first, a registering body: no person, even though his qualifications have been obtained by examination, is a *legally qualified* medical practitioner until his name appears on the Medical Register. Secondly, it is a standardising body, ensuring that there is a definite minimum of medical education and scientific examination. Thirdly, it is a penal and disciplinary body, having power to remove from the Register any practitioner convicted of felony or misdemeanour or adjudged guilty of professional misconduct. Fourthly, to the Council is committed the codification of pharmaceutical remedies. The duties of the Council are thus primarily of a public nature, and its construction shows its fitness for its fourfold responsibilities.

The Council consists of 38 members, of whom 18 are appointed by universities and nine by licensing corporations. Five members are chosen by the Crown on the advice of the Privy Council, and six others are elected by the members of the medical profession as Direct Representatives. The Crown members and the university representatives need not be medical men, and one layman now sits on the Council. Three members are appointed for dental business by the Privy Council under the Dentists Act, 1921, under which the powers and duties of the General Medical Council with regard to the keeping of the Dentists Register and the administration of the Dentists Acts were largely transferred to the Dental Board of the United Kingdom.

The Educational Curriculum.

Professional Education.—The course of professional study after registration as a student occupies at least five years. The Final Examination in Medicine, Surgery, and Midwifery must not be passed before the close of the fifth academic year of medical study.

REGULATIONS AS TO REGISTRATION OF MEDICAL STUDENTS.

Before registration as a student every candidate should produce evidence that (*a*) he has attained the age of 17 years; (*b*) that he has passed a recognised examination in general education; and (*c*) that, *in addition thereto*, he has passed, or obtained exemption from, an examination, theoretical and practical, in elementary physics and elementary chemistry conducted or recognised by a licensing body. The minimum standard of General Education required is that of University Matriculation or entrance examination in the Faculties of Arts or Pure Science. In other Faculties the examination must be of the standard prescribed in Regulation 2 below.

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to the several licensing bodies, medical
hospitals, or at the offices of the Council; and should produce proof that he, or she, has fulfilled the first three conditions.

MAINTENANCE OF REGISTER OF MEDICAL STUDENTS.

1. The Education Committee prepares and issues from time to time a list of examining bodies whose examinations in general education fulfil the conditions of, and are specially recognised by, the Council.

2. The Council has recognised the undernoted university examinations which are conducted in Great Britain and admit to the Faculties of Arts or Pure Science, or to other Faculties, subject to the conditions specified below:—

Oxford University, Responsions; Cambridge University, The Previous Examination. The Matriculation Examinations of the following Universities: Birmingham, Bristol, Durham, Leeds, Liverpool, London, Victoria of Manchester, Sheffield and Wales, and the Entrance or Preliminary Examination of the Universities of Scotland.

The condition prescribed by the Council in Faculties other than Arts or Pure Science is that:—

The certificate shall bear evidence that the candidate has passed in the Matriculation or Entrance standard, in the following subjects, viz.: (*a*) English. (*b*) Mathematics, Elementary. (*c*) A language other than English. (*d*) A fourth subject, as defined in the regulations of the particular Examination, to be chosen from the subjoined list, viz.: History, Geography, Physical Science, Natural Science, Botany; Latin, Greek, Hebrew, French, German, or other language accepted by the University for the purpose of matriculation or entrance.

3. Subject to the condition prescribed above (Section 2), the Council will recognise those of the examinations conducted by recognised authorities in Great Britain which are accepted by any one or more of the above-named Universities as equivalent (under prescribed conditions as to "credits" or "grades"), for purposes of Entrance or Matriculation, to an Examination named in the preceding list (Section 2). In School or Leaving Certificates, the four required subjects must have been obtained at not more than *two* sittings. Such Examinations are:—

Bristol University: Higher School Certificate Examination; School Certificate Examination. Cambridge Local Examinations Syndicate: Higher School Certificate Examination; School Certificate Examination. Central Welsh Examination Board: Higher Certificate Examination; School Certificate Examination. Durham University: Higher Certificate Examination; School Certificate Examination. London University: Higher School Certificate Examination; General School Examination. Northern Universities Joint Matriculation Board: Higher Certificate Examination; School Certificate Examination. Oxford and Cambridge Schools Examination Board: Higher Certificate Examination; School Certificate Examination. Oxford Delegacy for Local Examinations: Higher School Certificate Examination; School Certificate Examination. Scottish Education Department: Leaving Certificate Examination.

4. The Council will continue to recognise certain Examinations conducted by Educational Bodies, other than those (mentioned in Section 3) whose Examinations are accepted by any one or more of the Universities of Great Britain. Recognition will not be extended under this Section to any Examination unless the Council is satisfied (*a*) that in scope and standard it is equivalent to a recognised Matriculation or Entrance Examination of a University of Great Britain, (*b*) that it fulfils the condition prescribed by the Council (Section 2), and (*c*) that the Examination has been completed at not more than two sittings. Such Examinations are:—

The College of Preceptors (England): Senior Certificate (with *credit*). The Educational Institute of Scotland: Preliminary Medical Certificate.

5. Subject to the prescribed condition (Section the Council will recognise the Entrance Examina to the School of Physic of the University of D and the Matriculation or Entrance Examinati the National University of Ireland, the Quee versity of Belfast, the Irish Royal Colleges of P and Surgeons; and also the Senior Grade o Certificate of the Department of Educati

Irish Free State, the Senior Certificate Examination of the Ministry of Education of Northern Ireland, and all examinations accepted by any one or more of the Universities of Great Britain or Ireland, as equivalent, for purposes of entrance or matriculation, to the above-named University Examinations.

6. Subject to the prescribed condition (Section 2), the Council will recognise all Examinations of Colonial or Foreign Universities which are accepted by any one or more of the Universities of Great Britain as equivalent, for purposes of entrance or matriculation, to an examination named in the list of examinations recognised by the Council (Section 2).

7. The Council will recognise the Final Examinations for Degrees in Arts or Science of any University of Great Britain or Ireland or of the British Dominions.

8. The registration of medical students shall be placed under the charge of the Branch Registrars.

9. Each of the Branch Registrars shall keep a register of medical students.

10. The Branch Registrar shall enter the student's name and particulars in the Students Register, and give him a certificate of such registration.

11. Each of the Branch Registrars shall supply to the several licensing bodies, medical schools, and hospitals, in that part of Great Britain or Ireland of which he is Registrar, blank forms of application for the registration of medical students.

12. A copy of the Medical Students Register prepared by each of the Branch Registrars shall be transmitted, on or before Dec. 31st in each year, to the Registrar of the General Council, who will distribute the list to the licensing bodies, medical schools, and hospitals.

All applications for special exceptions to the foregoing regulations as to registration shall be addressed to the Registrar of the General Council, and shall be decided by authority of the Education Committee, who shall report thereon to the Council.

MEDICAL SCHOOLS AND COLLEGES.

The Universities, including their Colleges and Medical Schools, and Schools of Medicine at which Medical Study may be commenced in the United Kingdom are set out seriatim in the following pages.

Medical Registration in Ireland.

By agreement between the Governments of Great Britain, of the Irish Free State, and of Northern Ireland — since confirmed by legislature at Westminster and Dublin—the powers and duties of the General Council of Medical Registration and Education are continued as heretofore in respect of qualifying bodies in the Irish Free State, and of medical practitioners qualified in the Irish Free State. Side by side with this a Medical Council has been set up in the Irish Free State with the duty of establishing and controlling a Register for the Irish Free State. Practitioners whose names are on the General Register, and persons who pass a qualifying examination in the Irish Free State, will be registered on the Irish Free State Register on payment of the prescribed fee. The Irish Free State Medical Council have, over those whose names are on the Irish Free State Register, the same disciplinary powers as are possessed by the General Council over those whose names are on the General Register. To possess the privileges of a qualified practitioner in the Irish Free State it is necessary to be registered in the Irish Free State Register.

The net result of the change in the law as regards the practitioner qualifying in the Irish Free State in the future is that: (1) If he intends to practise only in the Irish Free State he need only register in the Irish Free State Register; (2) if he intends to practise in Great Britain he will register in the General Register; and (3) if he is in doubt where he will practise he will register in both Registers. He will, as he registers in one Register, or in both Registers, put himself under the disciplinary control of the one Council or of both Councils. No practical inconvenience is caused, and practitioners qualified in the Irish Free State in future will not find themselves deprived of any of the privileges or rights enjoyed by their predecessors.

Dental Board of the United Kingdom.

Anyone who is on the Medical Register is entitled to practise as a dentist, although he cannot register as such without degree or licence in dentistry; but it is a distinct advantage to take a special dental qualification, otherwise few dental appointments at general or special hospitals or dispensaries are available, and, unless registered in the Dentists Register, no dental work, under the additional Benefit Scheme of the National Health Insurance Act can be undertaken.

Under the Dentists Act, 1921, the powers and duties of the General Medical Council under the Dentists Act, 1878, and under the Medical Act, 1886, which related to the keeping of the Dentists Register and the administration of the Dentists Acts were largely transferred to the then newly constituted Dental Board of the United Kingdom. The registration of dental students at the commencement of their dental studies, and the right of erasure of a name from the Dentists Register, remain with the Council, but the duty of inquiring into disciplinary cases rests with the Board, upon whose recommendations the Council acts.

The Dental Board consists of a chairman and 12 members. The chairman is appointed by the Privy Council. Other members of the Board are appointed by the Minister of Health, the Scottish Board of Health, the Governor-General of Northern Ireland, the General Medical Council (3), Direct Vote of the qualified dentists practising in England and Wales, Scotland, and Ireland (3), Direct Representatives by dentists registered under the Dentists Act, 1921.

REGISTRATION OF DENTAL STUDENTS.

The General Medical Council's Regulations in regard to the registration of dental students which came int force on Jan. 1st, 1923, provide that the registration dental students shall be carried on at the Gener Medical Council Office in London, in the same mann as that of medical students, and be subject to th same regulations as regards age and preliminary examinations; but in the case of dental students professional study may commence either at a recognised dental hospital or school, or by pupilage with a registered dental practitioner.

Candidates for a diploma in dental surgery should produce certificates of having been engaged for at least four years in professional studies, and of having received during 24 calendar months instruction in dental mechanics. It is recommended that instruction in dental mechanics be taken at a recognised dental hospital and school. If any part of such instruction be taken by the candidate as a pupil with a registered dental practitioner, the time required to be devoted to it shall be at least twice the time required for the corresponding instruction taken at a dental school. Two years' bona-fide apprenticeship with a registered dental practitioner, after registration as a dental student, may be counted as one of the four years of professional study. When a student can show evidence of regular pupila
that two years in dental mechanics
dental practitioner, prior to the
prescribed preliminary and scientific ex
may be allowed to antedate his regi
period not exceeding one year prior to
these examinations.

Offices.

The address of the Registrar, to w
communications should be addressed, is
The Registrar of the General Medi
44, Hallam-street, Portland-place, Lon
The offices of the Dental Board are ad

A memorandum on the procedure to
by those who desire to enter the profession
with notes on costs and prospects, and
Memorandum in regard to Dentistry, may b
on payment of 1s. each.

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MEDICAL EXAMINING BODIES AND SCHOOLS IN ENGLAND AND WALES.*

UNIVERSITY OF OXFORD.

THERE are two degrees in Medicine, *B.M.* and *D.M.*, two in Surgery, *B.Ch.* and *M.Ch.*, and a diploma in *Ophthalmology*. The examinations are open to men and women alike.

Only Graduates in Arts of the University are eligible for the Medical and Surgical degrees. The most convenient course for the B.A. degree for intending graduates in Medicine is to take Responsions, the Preliminary Science Examinations mentioned below, and the Final Honour School of Physiology. To obtain the degrees of B.M. and B.Ch. the following examinations must be passed: 1. Preliminary subjects: Physics and Chemistry, Zoology, and Botany. 2. Professional. (*a*) First Examination: Subjects—Organic Chemistry, unless the candidate has satisfied the examiners in Part I. Chemistry in the Honour School of Natural Science; Human Physiology, unless he has obtained a First or Second Class in Animal Physiology in the Honour School of Natural Science; Human Anatomy. (*b*) Second Examination: Subjects—Medicine, Surgery, Midwifery, Pathology, Forensic Medicine and Public Health, Materia Medica and Pharmacology. The First and Second Professional examinations are held in June and December. The first B.M. examination may be passed at any time after the Preliminary Scientific examinations. Anatomy and Physiology must be passed at the same time—Organic Chemistry may be taken separately.

At any time after passing *First B.M. Examination*, the candidate can, on producing certain certificates, present himself for examination in the subjects of Pathology, Forensic Medicine and Public Health, Materia Medica and Pharmacology; but cannot, unless he is already a registered medical practitioner, enter for Examination in Medicine, Surgery, and Midwifery, until the eighteenth term from his matriculation, nor until a period of at least thirty-three months has elapsed from the date of passing the First B.M. Examination. He must pass in Medicine, Surgery, and Midwifery at one and the same time.

Before admission to the Examinations in Pathology and Bacteriology, and Materia Medica and Pharmacology, of the *Second B.M. Examination*, the student must produce certificates of having attended courses of instruction including practical work in Pathology, Bacteriology, Post-mortem Clerking, Pharmacology, and Pharmacy, either in Oxford or in a recognised Medical School. Before admission to the remainder of the second B.M. Examination, he must produce a number of other certificates, including certificates of having acted as Clinical Clerk and Dresser, each for six months in the Wards, of instruction in Midwifery and of attendance on Labours, of instruction in Infectious Diseases and in Ophthalmology, of proficiency in Vaccination and in the administration of Anæsthetics, and of three academic years of hospital practice.

The degree of Bachelor of Surgery (B.Ch.) is granted with that of B.M. after passing the above examinations.

The degree of Doctor of Medicine (D.M.) is granted to Bachelors of Medicine of the University who have entered upon their thirtieth term from Matriculation, and have submitted a dissertation which is approved by judges appointed for the purpose by the Board of the Faculty of Medicine. The degree of Master of Surgery (M.Ch.) is granted after examination to Bachelors of Surgery who have entered upon their twenty-first term, and who are members of the surgical staff of a recognised hospital, or have acted as dresser or house surgeon in such a hospital for a period of six months. The examination, which includes Surgery, Surgical Anatomy and Pathology and Surgical Operations, is held annually in June, after the Second B.M. examination.

Travelling Fellowship, Scholarships, and Prizes.—A Radcliffe Travelling Fellowship is awarded annually after an examination held in February. It is tenable for two years and of the annual value of £300. The examination is in Physiology, Pathology, and Hygiene, and is partly "practical." Candidates must be graduates in Medicine of the University. The holder must travel abroad for the purpose of medical study. Application should be made to the Radcliffe Examiners, Department of Medicine, University Museum. A Schorstein Research Fellowship of the value of £200 a year, tenable for two years, is offered in alternate years. Candidates must be graduates of the University, under 35 years of age, and must hold a registrable medical qualification. Their research must be carried out in one of the Medical Departments at Oxford. A Christopher Welch Scholarship of £100, tenable for four years, is awarded annually after examination. Candidates must be men undergraduate members of the University, who have not exceeded the twelfth term from their matriculation, or been admitted to any degree in the University. They may offer any one of the subjects, Animal Physiology, Botany, Zoology. A George Herbert Hunt Travelling Scholarship of the value of about £100 is awarded every second year to enable a Bachelor of Medicine to undertake three months' study abroad. A Rolleston Memorial Prize is awarded once in two years to members of the Universities of Oxford and Cambridge of not more than ten years' standing for an original research in some Biological subject, including Physiology or Pathology. The Radcliffe Prize, founded by University College (1907), is of the value of £50 and is awarded biennially (alternating with the Rolleston Memorial Prize) for research in some branch of medical science. The Theodore Williams Scholarships, each of the value of £50 a year for two years, are awarded annually in the subjects of Anatomy, Physiology, and Pathology. A Radcliffe Scholarship in Pharmacology, of the value of £50 for one year, is awarded annually by the Master and Fellows of University College. Scholarships at certain London hospital medical schools are awarded each year on the nomination of the Regius Professor of Medicine or of the Dean of the Medical School. The Scholarships and Exhibitions in Science which are offered by most Colleges are open to those who intend to pursue Medicine. The value of these scholarships varies, according to the candidate's need, between £30 and £100 a year; the exhibitions vary in value from £30 to £100 per annum. The number of scholarships and exhibitions in Science offered annually is about forty. There are also Medical Scholarships of the value of £100 a year at University College and at Pembroke College. The Welsh Memorial Prize for Anatomical drawing is awarded annually, and is of the value of about £10.

More detailed information may be obtained from the University Calendar; from the Examination Statutes, 1931–32; from the Regius Professor of Medicine; from the Professors in the departments of medical science; and from the Dean of the Medical School, Oxford.

Radcliffe Infirmary and County Hospital.

There are 265 beds. Courses of instruction are given in connexion with the Oxford University Medical School. These include (1) a course in Practical Medicine by the Regius Professor of Medicine; (2) clinical lectures by the Litchfield Lecturers in Medicine and Surgery; (3) tutorial instruction and demonstrations in special Regional Anatomy (medical and surgical), methods of Medical and Surgical Diagnosis, and Surgical Manipulation; and (4) pathological demonstrations and instruction in post-mortem work are given by the Pathologist. Opportunities are offered to students who wish to act as surgical dressers and clerks. A post-graduate course is held in the hospital in the autumn of each year.

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* For special diplomas see p. 435.

UNIVERSITY OF CAMBRIDGE.

There are two degrees in Medicine, *M.B.* and *M.D.*, two in Surgery, *B.Chir.* and *M.Chir.*, and Diplomas in *Public Health, Hygiene, Tropical Medicine* and *Hygiene*, and *Medical Radiology and Electrology.* Students of Girton or Newnham College are admitted to the examinations for these degrees and diplomas.

The student must enter a College, or become a Non-Collegiate student, and keep nine terms (three years) by residence. He must pass the Previous Examination of the University before he comes into residence or therefrom obtain exemption, particulars of which may be obtained from the Registrary. He may then devote himself to medical study in the University. Or he may, as nearly all students now do, proceed to take a degree in Arts by passing the Examinations for the Ordinary B.A. degree, or an Honours degree by passing one or more Tripos Examinations. The Natural Sciences Tripos is taken most frequently by medical students, as some of the subjects are practically the same as those for the First and Second M.B. Examinations.

For the degree of Bachelor of Medicine (M.B.) five calendar years of medical study are required either in Cambridge or at one of the recognised Schools of Medicine. The first three years are spent in Cambridge till the student has passed the examination for Part I. of the Natural Sciences Tripos and the *First and Second M.B. Examinations.* Hospital practice may be attended at Addenbrooke's Hospital, Cambridge, after the student has passed Parts I. and II. of the *Second Examination.* The laboratories for Botany, Chemistry, Physics, Biology, Zoology, Human Anatomy, Physiology, Biochemistry, Pathology, Bacteriology, Pharmacology, Psychology, and Public Health are well equipped. Addenbrooke's Hospital, the Infectious Diseases Hospital, the Cambridge Research Hospital, and the Field Laboratories are utilised for study and research.

There are three examinations for M.B. The *First* includes (1) General and Inorganic Chemistry, (2) Mechanics, (3) Physics, and (4) Elementary Biology. These parts may be taken together or separately. The *Second* is divided into three parts—viz. (1) Organic Chemistry, (2) Human Anatomy and Physiology, and (3) Pharmacology and General Pathology. The *Third* is divided into two parts: (1) Principles and Practice of Surgery (including Special Pathology and Midwifery and Diseases Peculiar to Women); and (2) Principles and Practice of Physic (including Diseases of Children, Mental Diseases, Medical Jurisprudence), Pathology (including Hygiene and Preventive Medicine), and Pharmacology (including Therapeutics and Toxicology). The examinations are partly in writing, partly oral, and partly practical, in the hospital, in the dissecting room, and in the laboratories. An Act has then to be kept by the candidate reading an original dissertation composed by himself and being examined orally on some subject approved by the Regius Professor of Physic. Candidates who have passed both parts of the Third M.B. examination are admitted to the registrable degree of Bachelor of Surgery (B.Chir.) without separate examination and without keeping an Act.

The degree of Doctor of Medicine (M.D.) may be taken three years after that of M.B. or four years after that of M.A. The candidate is required to produce certificates of having been engaged in Medical Study for five calendar years, and if an M.A. to pass the same examinations as are required for the degree of M.B. An Act has to be kept, consisting of an original Thesis with *viva voce* examination; and a short extempore essay has to be written on a topic taken from the general subject of his thesis, whether it be Physiology, Pathology, Pharmacology, the Practice of Medicine, State Medicine, or the History of Medicine.

Candidates for the Degree of Master of Surgery (M.Chir.) who are M.A.'s may be admitted to the examination after they have become legally qualified under the *Medical Acts* to practise surgery. Others may be admitted to the examination when two years at least have elapsed after they have completed all that is required of candidates for the Degree of B.Chir. Candidates are required to pass an examination in Principles and Practice of Surgery, Surgical Anatomy and Surgical Operations, and Pathology, and to write an extempore essay on a Surgical Subject. (The examination is held in February.)

A Diploma in Medical Radiology and Electrology is granted. Candidates must hold a recognised medical qualification. All teaching for the Diplomas in Public Health, in Hygiene, and in Tropical Medicine and Hygiene will cease after Sept. 30th, 1931, and no examinations will be held after April, 1932.

Scholarships and Prizes.—Medical studies are endowed by the numerous Natural Science scholarships at the various colleges, information about which can be obtained from the respective Tutors. There are Natural Science scholarships at most of the Colleges and prizes in the ancillary medical subjects. Some of these are entrance scholarships; some may be gained by students already in residence, and where suitable candidates are not forthcoming among such students the emoluments may be allotted to members of other Colleges. Valuable scholarships instituted on behalf of Medicine are the Tancred Studentships in Physic, tenable at Gonville and Caius College. The successful candidates must enter at the college within a month or remove there if they are members of any other college. Students are required to take the degree of M.B. as soon as they are of sufficient standing but may hold a Studentship for a further three years. Thus a student elected previous to admission to college can draw the emolument, the annual value of which is about £100, for eight years. Full particulars can be obtained from Mr. E. T. Gurdon, 28, Lincoln's Inn-fields, London. Among other scholarships and prizes may be mentioned the Balfour Studentship, for research in Biology, of the value of £300 a year for three years, not restricted to members of the University; the Frank Smart Studentship and Prizes for Botany and Zoology, and the Shuttleworth Studentship for Zoology or Physiology tenable at Gonville and Caius College. The one University prize in Medicine, the Raymond Horton Smith Prize, is awarded to that candidate for the degree of M.D. who presents the best thesis for the degree during the academical year, provided that he has taken honours in a Tripos Examination.

An abstract of the Regulations and Schedules of the range of the examinations in Chemistry, Mechanics, Physics, Biology, Pharmacology, and General Pathology may be obtained upon application to the Registrary, The Registry, Cambridge.

Addenbrooke's Hospital.

Over 200 beds. Clinical Lectures in Medicine and Surgery, in connexion with Cambridge University Medical School, are given at this hospital twice a week during the academical year; and practical instruction in Medicine and Surgery is given in the wards and out-patients' rooms by the physicians and surgeons daily during the term time and vacations. The fee for pupilship is 3 guineas a term, 9 guineas a year, 12 guineas perpetual. Further information may be obtained from Mr. Vernon Pennell.

UNIVERSITY OF LONDON.

The University of London was constituted in 1836, reconstituted under the Act of Parliament, 1898, as a teaching as well as an examining body, and again reconstituted under Act of Parliament, 1926. All the metropolitan medical schools are constituent colleges, while Clinical Units have been established at St. Bartholomew's, the London, St. Mary's, St. Thomas's, University College Hospital, and the Royal Free.

Internal and External Students.—All the examinations of this University are open to men and women alike. Matriculated students of the University may be either internal or external. Internal students of the University are students who are registered as pursuing a prescribed course of study, or an approved course of research, in a school of the University, or under teachers of the University. Centres for preliminary and intermediate medical studies have been established by the University at University and King's Colleges. External students in addition to matriculating must register as preparing for an examination leading to a Degree or Diploma within the purview of the Council for external students.

University College.

University College has been constituted a University centre for the teaching of medical sciences. The College Faculty of Medical Sciences comprises the Departments of Physics, Chemistry, Botany, and Zoology (the Preliminary Medical Sciences); also the Departments of Anatomy, Histology, Physiology, Biochemistry, and Pharmacology (the Intermediate Medical Sciences). Research work is undertaken in all departments. The completion of the building scheme by the erection of the section for Anatomy, Histology, and Embryology, together with further extensions to the Department of Physiology and Biochemistry, which the generosity of the Rockefeller Foundation made possible, provides exceptional facilities for research and post-graduate study in anatomy, physiology, and pharmacology. In particular might be specified the opportunities for investigation in human and comparative embryology and neurology, in histology, radiology, anthropology, biochemistry, and experimental physiology and experimental embryology. Arrangements exist for the close correlation of the work of the Faculty with University College Hospital and Medical School. Women students are admitted.

Scholarships and Prizes.—The first four items on the present list require a complete intermediate course at University College. The money value and subjects at examinations are as follows: (*a*) The Bucknill Scholarship, 160 guineas; (*b*) and (*c*) two Entrance Exhibitions, 55 guineas each, Chemistry, Physics, Botany, and Zoology; (*d*) Entrance Scholarship, £30 a year for three years; (*e*) Cluff Memorial Prize, £15 biennially, Anatomy, Physiology, Pharmacology, and Chemistry; (*f*) Schafer Prize in Physiology, £18 triennially; (*g*) Sharpey Physiological Scholarship, £115, Biological Sciences; (*h*) Bayliss-Starling Scholarship, £120 a year, Physiology, Biochemistry; (*j*) Morris Bursary for sons of deceased professional men, by nomination, tenable for two years, £20 a year; and (*k*) five Gold and five Silver Medals awarded annually in various departments. For further information apply to the Secretary, University College, Gower-street, London, W.C.1.

King's College.

The Medical Faculty at this College gives instruction in the subjects of Medical Science for the Preliminary and Intermediate Examinations in Medicine and Surgery, and Dental Surgery, of the University of London and of other Universities and examining bodies, to students entering the College directly, and also to students of the following four hospital schools which prepare only for the final examinations—viz., King's College Hospital, Westminster Hospital, St. George's Hospital, and Charing Cross Hospital. The Faculty is open to both men and women. Special courses in Anatomy and Physiology in preparation for the Primary Examination for the F.R.C.S. (England) are held twice yearly.

Scholarships and Prizes.—Two or more Warneford Entrance Scholarships of £30 each for four years. Examination in April, subjects selected from Divinity, Classics, Science. Sambrooke Scholarship of £30 for three years. Examination in April, subjects selected from Classics, Science. Worsley Scholarships: £100 in five annual instalments of £20. *At the end of the First Year* of study, the Rabbeth Scholarships (£30 and £15), the *Carter* Gold Medal and Prize in Botany, and the Hare Prize in Zoology are open for competition. *At the end of the Third Year*, the Hughes Prize in Anatomy, the Huxley Prize in Physiology, the Inchley Prize in Pharmacology, and the Jelf Medal are open for competition. The Layton and the Berridge Research Studentships (£150 per annum *each*), the Daniell Scholarship in Chemistry (£40), Warneford Prizes (£25 and £15), Leathes Prize, Barry Prize, &c., are also open to Students of this Faculty. The majority of the Scholarships and Prizes are open to Regular Students only. For further information apply to the Dean of the Medical Faculty.

Medical students of the University of London, who are pursuing their medical curriculum in the metropolis will proceed to one of the recognised medical schools connected with the University. At four of these schools the preliminary studies will be taken at King's College, while at the other schools the whole curriculum can be taken out in connexion with the selected hospital. These hospitals are St. Bartholomew's Hospital, Charing Cross Hospital, St. George's Hospital, Guy's Hospital, King's College Hospital, the London Hospital, St. Mary's Hospital, the Middlesex Hospital, St. Thomas's Hospital, University College Hospital, Westminster Hospital, and the London (Royal Free Hospital) School of Medicine for Women. Various schools and hospitals are also recognised as schools of the University in special departments, and students may pursue their studies at other approved universities and medical schools, presenting themselves for examination at the University.

The FACULTY OF MEDICINE of the University grants the joint degrees of M.B., B.S. (*Bachelor of Medicine and Surgery*), the higher separate degrees of M.D. (*Doctor of Medicine*) and M.S. (*Master of Surgery*), and the degree of B.D.S. (*Bachelor of Dental Surgery*) and the degree of B.Pharm. (*Bachelor of Pharmacy*); the two higher degrees being open only to candidates holding the M.B., B.S. degrees of the University. The curriculum for the M.B., B.S. degrees is five and a half years from the time of matriculation, with certain exceptions which must be looked for in the official regulations of the University.

A. *Internal Students.*—For the Bachelor's degrees in Medicine and Surgery a student must normally, after registration as an internal student, have: (1) Attended prescribed courses of study for five and a half years in one or more schools of the University. (2) Passed the following examinations, under the conditions mentioned below: (*a*) The First Examination for Medical Degrees in Inorganic Chemistry, Physics, including Mechanics, and General Biology; (*b*) the Second Examination for Medical Degrees: Part I., Organic Chemistry; Part II., Anatomy, Physiology, and Pharmacology; (*c*) the Third Examination for Medical Degrees, or M.B., B.S. Examination in Medicine, Surgery, Obstetrics and Gynæcology, Pathology, Forensic Medicine, and Hygiene.

B. *External Students.*—For the Bachelor's degrees in Medicine and Surgery an external student must (1) have passed the Matriculation examination or have been exempted therefrom not less than five and a half years previously; (2) have passed subsequent examinations similar to those required of an internal student; and (3) have been engaged in professional studies during the five and a half years subsequently to Matriculation and four and a half years subsequently to passing the First Examination for Medical Degrees at one or more of the medical institutions or schools recognised by this University for the purpose, one year at least of the four and a half years to have been spent in one or more recognised institutions or schools in the United Kingdom.

The First Examination for Medical Degrees (*Inorganic Chemistry, Physics, including Mechanics, and General Biology*) will take place twice in each year, commencing on the Monday following Dec. 7th and on the first Monday in July. It must be passed not less than nine months after matriculation.

The Second Examination for Medical Degrees (*Part I.*): *Organic Chemistry.*—This examination will take place twice in each year, commencing on the Thursday following the second Monday in March and on the Thursday following the first Monday in July. No candidate will be admitted to this examination until he has completed the First Examination.

The Second Examination for Medical Degrees (Part II.) takes place twice in every year, commencing on the Tuesday following the third Monday in March and on the Tuesday following the first Monday in July. No candidate shall be admitted to the examination unless he has passed the First Examination for Medical Degrees at least 18 months previously, and has passed Part I. of the Second Examination for Medical Degrees.

The Third or M.B., B.S. Examination.—The M.B., B.S. examination takes place twice in each year, commencing on the second Monday in November and on the first Monday in May. No candidate will be admitted to this examination unless he has completed the Second Examination for Medical Degrees, together with a course of study summarised below, nor within three years from the date of passing the Second Examination, Part II., in Anatomy and Physiology. The course of study comprises introductory course in (1) Clinical Medicine; (2) Clinical Surgery; (3) Clinical Pathology; (4) Experience as Clinical Clerk; (5) Clinical Medicine; (6) (*a*) Fevers, (*b*) Children's Diseases, (*c*) Venereal Diseases, (*d*) Mental Diseases (at a recognised Asylum), (*e*) Dermatology, (*f*) Vaccination, (*g*) Materia Medica and Pharmacy; (7) Experience as a Surgical Dresser; (8) Clinical Surgery; (9) Ophthalmology; (10) Oto-Rhino-Laryngology; (11) (*a*) Operative Surgery, (*b*) Applied Anatomy, (*c*) Administration of Anæsthetics, (*d*) Dental Surgery, (*e*) Orthopædic Surgery, (*f*) Mechano-therapeutics; (12) Obstetrics and Gynæcology; (13) Lying-in Hospital; (14) The conduct of at least 20 Labours; (15) Antenatal Clinic; (16) Experience as a Clinical Clerk in Gynæcological Work; (17) General Pathology, Morbid Anatomy, Bacteriology, and Chemical Pathology; (18) Work in the Post-mortem Room; (19) Clinical Laboratory; (20) Forensic Medicine; (21) Hygiene. He must have attended the Medical and Surgical Practice of a recognised hospital for two years, and have held the posts of clinical clerk and surgical dresser for periods of six months each. Candidates will be examined in Medicine, Pathology, Forensic Medicine and Hygiene, Surgery, Obstetrics, and Gynæcology. The subjects may be divided into two groups, namely: (1) Medicine, Pathology, Forensic Medicine, and Hygiene; and (2) Surgery, Obstetrics, and Gynæcology. These groups may be taken either separately or together. Bachelors of Medicine who graduated before May, 1904, may obtain the B.S. by passing the Surgical part of the M.B., B.S.

Doctor of Medicine.—The examination for this degree takes place twice in each year, commencing on the second Monday in December and on the first Monday in July. Candidates may present themselves for examination in one of the following branches—namely: (1) Medicine; (2) Pathology; (3) Psychological Medicine; (4) Midwifery and Diseases of Women; (5) State Medicine; and (6) Tropical Medicine. Any candidate for the degree of M.D. (except in branch 5) may transmit to the Registrar a thesis for approval and may be exempted from a part or from the whole of the written examination.

Master of Surgery.—The examination for the degree of Master of Surgery takes place twice in each year: (1) Surgery; (2) Dental Surgery; (3) Ophthalmology; (4) Laryngology, Otology, and Rhinology. A thesis may be submitted as for M.D.

Doctor of Philosophy.—A Degree of Ph.D. has been instituted in non-clinical subjects for Internal and External Students in the Faculty of Medicine. Candidates for this degree must hold, in a branch of study akin to that in which they propose to proceed to the Ph.D. Degree, the Degree of M.B., B.S., or B.D.S., or B.Pharm., or B.Sc.

Bachelor of Pharmacy.—The course extends over three years.

Full details of the prescribed curricula can be obtained free on application to the Academic Registrar, or for External Degrees from the External Registrar, University of London, South Kensington, S.W. 7.

MEDICAL SCHOOLS OF THE UNIVERSITY OF LONDON.[1]

St. Bartholomew's Hospital and College.

The hospital contains 762 beds, of which 692 are for patients in the hospital at Smithfield and 70 at the Alexandra Hospital, Swanley. Special departments have been organised for Diseases of Women and Children, the Eye, Ear, Larynx, and Skin, as well as for Orthopædic and Dental Surgery, and for Electrotherapeutics and X Ray work. Whole-time Clinical Units under Professors of Medicine and Surgery have been established. A new Surgical Block of ten wards, with accommodation for 250 patients, and connected with a block of five new operation theatres is now in use.

Ten house physicians and ten house surgeons are appointed annually, are provided with rooms and board, and receive £80 a year as salary. A resident midwifery assistant, an ophthalmic house surgeon, and a house surgeon for diseases of the throat, nose, and ear, and a house surgeon for orthopædic surgery are appointed every six months, and are provided with rooms and board and receive a salary of £80 a year. Three resident administrators of anæsthetics are appointed, the senior for one year at a salary of £150, and two juniors for six months with a salary at the rate of £80 per annum, with board and rooms. An extern midwifery assistant is appointed every three months, and receives a salary of £80 a year. The clinical clerks, the obstetric clerks, the clerks to the medical out-patients, the dressers to the surgical in-patients and to the out-patients, and the dressers in the special departments are chosen from the students.

There are quarters for the resident staff, casualty, medical, surgical, and special out-patient departments, casualty wards, dispensary, and clinical lecture theatre. There is a chemical laboratory attached to the College as well as a laboratory devoted to instruction in Public Health. A block is devoted to Pathology, and contains the post-mortem room as well as extensive laboratories for bacteriology, clinical pathology, and pathological chemistry. *The Medical College Buildings* include three large lecture theatres, a large dissecting-room, laboratories for chemistry, biology, morbid anatomy and histology, and public health, as well as a spacious library (containing 14,500 volumes), a well-appointed museum of anatomy, physiology, comparative anatomy, materia medica, botany, and pathological anatomy. The pathological museum is complete. A new block in Giltspur-street has recently been acquired and has been fitted up as lecture theatres and laboratories for physics, chemical physiology, experimental physiology, histology, and pharmacology.

Special Classes for the Primary and Final F.R.C.S. are held twice yearly. *Instruction in Preliminary Science* is given to University of London students in chemistry, biology, and physics throughout the year. Facilities for research work are afforded in the Clinical Units and Laboratories of pathological and other departments.

Scholarships given in aid of Medical Study.—Six Entrance Scholarships and Exhibitions are awarded annually—viz.: (1) and (2) a Scholarship of £100 and an Exhibition of £60 in any Two of the following subjects: Human Anatomy and Embryology, Physiology, Pathology (including Bacteriology), Biochemistry; (3) a Scholarship of £100 in not fewer than three of the following: Chemistry, Physics, Botany, Zoology, and Physiology; (4) and (5) a Scholarship of £100 and the Jeaffreson Exhibition of £50 in Mathematics, Latin, or Greek or French or German, a second Language or Chemistry or Physics;

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[1] Of these schools that of the Royal Free Hospital is reserved for women; University College and King's College admit men and women, the former limiting the number of women when clinical work is reached; the remainder admit men only.

(6) the Shuter Scholarship of £50 in Anatomy and Physiology, which is awarded after competitive examination among Cambridge Graduates. The more important of the other Scholarships and prizes are as follows:—Four Junior Scholarships—(7) No.1, £30, Anatomy and Physiology (8) No. 2, £20 Anatomy and Physiology; (9) No. 3, £25, Chemistry, Physics, and Biology; (10) No. 4, £15, Chemistry, Physics, and Biology; (11) Senior Scholarship, £50, Anatomy, Physiology, and Chemistry; (12) Kirkes Scholarship, £30 and medal, Clinical Medicine; (13) and (14) two Brackenbury Scholarships, £39 each, one in Medicine and one in Surgery; (15) Sir G. Burrows Prize, 10 guineas, Pathology; (16) Skynner Prize, 13 guineas, Regional and Morbid Anatomy; (17) Matthews Duncan Medal and Prize, £20, Midwifery and Gynæcology; (18) Luther Holden Research Scholarship in Surgery, awarded by election, £105; (19) Lawrence Research Scholarship and Gold Medal in Pathology, awarded by election, £115; and (20) Baly Scholarship in Clinical Medicine, £75, awarded by examination.

The recreation ground of 10 acres is at Winchmore Hill for the use of the members of the Students' Union, which all students are expected to join. The Students' Union contains a large reading and smoking room, a committee and writing room, luncheon and dining hall, and a miniature rifle range.

Information may be obtained on application to the Dean of the Medical College, Mr. W. Girling Ball.

Charing Cross Hospital.

The Hospital, to which the School is attached, contains 300 beds, shortly to be increased by a number available for paying patients. There are special departments for Mental Diseases, Midwifery, Diseases of Women, of Children, of the Skin, Ear, Throat, Nose, and Teeth, for Orthopædic Cases, X ray work, and for Electrical Treatment. In the Medical School Demonstratorships and Assistant Demonstratorships are open to students of the School. Six House Physicians, six House Surgeons, two Obstetric and Gynæcological House Surgeons, and six House Surgeons to the Special Departments are appointed annually. The following appointments are open to students after they have held resident appointments: Resident Medical Officer, at a salary of £400 per annum; Registrar to the Medical, Surgical, Obstetrical, and Ear, Nose, and Throat Departments, at £150 per annum.

Primary and Intermediate students to receive their lectures and practical work at King's College, and final studies are taken in the school and hospital, where systematic lectures, demonstrations, and tutorial classes are arranged in general and special subjects.

At an Institute of Pathology, with a whole-time staff of scientific workers and fully equipped laboratories, students receive their training in Preventive Medicine, Pathology, and Bacteriology, with special facilities for research, and post-graduate teaching is available. The course in Ophthalmology is given in the Royal Westminster Ophthalmic Hospital. Courses in General Medicine, Surgery, and Pathology, with the requisite Clinical work in the wards and out-patient departments are provided for students reading for Dental qualifications.

The Pathological Museum, containing over 4000 specimens and 3000 histological preparations, comprises (1) The Section on General Pathology, and (2) the Cuthbert Lockyer Collection of over 1150 Gynæcological and Obstetrical specimens.

The Library contains 3950 volumes.

The Students' Club, with smoking and luncheon rooms on the school premises, cloak room, telephone, &c., provides for the social comfort and convenience of the students. The club is controlled by a committee of students, and includes the Medical Society and the Dramatic Society. The *Gazette* is published quarterly. The sports ground, of 13 acres, at Colindale, provides facilities for Rugby and Association football, cricket, hockey, and tennis (hard and lawn courts). In addition there are sections of the club devoted to athletics, boxing, swimming, and golf.

Scholarships.—The following are offered annually: (*a*) For students commencing medical studies—two scholarships, each of the value of £50; (*b*) for students commencing clinical studies—two "University" scholarships, each of the value of £120, in Pathology; one "University" scholarship, value £120, and one "Open" scholarship, value £75, in Anatomy and Physiology. In addition there are a number of Exhibitions.

Prizes.—(1) The "Llewellyn" Prize, £25, for highest distinction throughout final course of studies; (2) "William Travers" Prize, £15, Midwifery and Gynæcology; (3) "Pereira" Prize, £4 4*s*., Clinical commentary; (4) "T. H. Green" Prize, £5 5*s*., Clinical commentary; (5) Clinical Surgery Prize, £3 3*s*.; (6) "John H. Morgan" Prize, £13; (7) "Steadman" Prize in Pathology; (8) Numerous class prizes and medals; and (9) The Governor's Clinical Gold Medal.

Further information may be obtained on application to the Dean, Mr. Eric A. Crook, M.Ch., F.R.C.S., or to the Secretary of the School.

St. George's Hospital.

This hospital has a service of 436 beds, of which 180 are allotted to surgical, 150 to medical cases, and 100 are at the Convalescent Hospital at Wimbledon. There are all the usual special clinical departments. One ward is set apart for Diseases Peculiar to Women, and there is a Maternity Ward of 11 beds. Children's beds are placed in the women's wards. There are two ophthalmic wards.

Twelve house physicians, 12 house surgeons, and 12 casualty officers are appointed annually. Special attention is directed to the following paid appointments, among others, which are open to students after they have held house office:—Resident Assistant Physician and Resident Assistant Surgeon, at £250 per annum each; Medical Officer to the Atkinson-Morley Convalescent Hospital, at £300 per annum; Medical Registrarship at £200 per annum, Surgical Registrarship at £200; Assistant Curatorship of the Museum at £100; Obstetric Assistantship (Resident) at £100; the post of Resident Anæsthetist at £100.

Entrance Scholarships and Endowed Prizes of a total value of £908 are awarded annually; a detailed list is placed below. The entire teaching and laboratories are now devoted to purely clinical subjects, and arrangements have been made with the authorities of King's College for students who enter the first, second, or third year of the curriculum as students of St. George's to carry out the necessary courses of instruction at that College. Students then complete their course, without payment of any entrance fee, in a school entirely devoted to clinical work.

Scholarships and Prizes.—At this school 11 entrance scholarships and exhibitions are given, the money value and the subjects of examination being as follows: (*a*) and (*b*) two William Brown Exhibitions, £120 and £80 respectively; (*c*) and (*d*) two Anne Selina Fernee Scholarships, £80 each; (*e*) Devitt-Pendlebury Scholarship, £50; (*f*) and (*g*) two Anne Selina Fernee Exhibitions, £60 each, Anatomy and Physiology, except in the case of (*c*) and (*f*) subject of examination for which is General Pathology.

In addition to the above Exhibitions, each of the value of £40 and up to four in number, will be awarded to candidates of approved merit in the Entrance Scholarships Examination. The others are as follows: (*h*) Allingham Scholarship in Surgery for Students qualified not more than two years, £87; (i) and (*j*) two Brackenbury Prizes, one in Medicine and one in Surgery, £33 each, open to students of not more than five years' standing; (*k*) H. C. Johnson Memorial Prize, £20, Practical Anatomy; (*l*) Pollock Prize, The institute comprises seven special departments, the whole being under the personal direction of Sir Almroth Wright. Certain Research Scholarships of £200 each are awarded annually to students working in the departments of the institute; and research beds have been instituted. Clerkships in Pathology, Bacteriology, and Chemical Pathology, lasting for a period of three months, are open to students of the fifth year, and enable them to carry out the Pathological and Bacteriological investigations of the wards, and learn the necessary technique under supervision. Seventy-two of these posts are available annually. Numerous appointments are open to newly qualified members of the Medical School, including ten salaried posts with salaries varying from £200 to £750 per annum. A special Post-graduate course is held during the first week-end in October, and is open to all General Practitioners and other qualified men without fee.

Entrance Scholarships.—Two Entrance Scholarships of the value of £210 each are awarded annually, by nomination in July, the Geraldine Harmsworth Scholarship, £200, and one or more University Scholarships of £200 are awarded in July.

The Athletic ground (10 acres) is situated at Wembley and can be reached in 20 minutes by a constant service of trains. A large pavilion has recently been added.

Rebuilding of the Medical School.—Building operations began in August, 1930, and the foundation stone was formally laid by H.R.H. the Duchess of York in June, 1931. It is hoped that the buildings will be ready for occupation at the end of 1932. The new School will contain departments for the teaching of all Preliminary and Intermediate subjects, and will include a student's club, dining and billiard rooms, and a gymnasium and swimming bath.

For further information apply to the Dean of the Medical School.

Middlesex Hospital.

The hospital and cancer wing contain over 470 beds, with special wards for Cancer, Maternity, Gynæcological, Otological, Neurological, and Ophthalmological cases, and for Diseases of Children. Other special departments include those for Diseases of the Eye, Ear, Nose and Throat, and Skin; Nervous Diseases, Orthopædic cases, Diseases of the Rectum and Venereal Diseases. There is also an Electro-therapeutic department and a department of Radium Therapy and Research. The Cancer Wing, containing 92 beds and Special Investigation Laboratories, offers unrivalled opportunities for the study of Cancer, both in its clinical and pathological aspects. In the Electrotherapeutic Department, students obtain instruction in the Treatment of Lupus and Cancer by the X ray method of treatment.

All appointments are made without fee of any kind, and the following are appointed at intervals annually: eight house physicians, eight house surgeons, two obstetric and gynæcological house surgeons, two casualty medical officers, two casualty surgical officers, one senior resident anæsthetist, two junior resident anæsthetists, and four resident officers to the special departments. Ten registrars are appointed annually. Non-resident qualified clinical assistants are appointed to assist in the various out-patient departments. Clinical clerks and surgical dressers are also appointed in every department.

The Medical School, which includes the Bland-Sutton Institute of Pathology, the Courtauld Institute of Biochemistry, the Barnato-Joel Laboratories, and the Ferens Institute of Otology, is fully equipped for the theoretical and practical teaching of all the subjects of the medical curriculum, for the Diplomas in Public Health, and the University of Cambridge Diploma in Radiology, for which two courses are held yearly. Ample laboratory and class-room accommodation is provided. The teaching staff includes 6 Professors, 26 recognised Teachers, 10 Demonstrators, 4 Tutors. The Bland-Sutton Institute of Pathology and the Courtauld Institute of Biochemistry are completely equipped for routine hospital investigations, teaching and research work, and contain large pathological, bacteriological, and clinical laboratories, also smaller laboratories for individual research work. A well-equipped Anatomical and Pathological Museum and Reference Library offer every facility.

Other features of interest are: the course in Medical Radiology and Electrology, under the direction of the "Joel" Professor of Physics; D.P.H. course, under the direction of Dr. Charles Porter, M.O.H., St. Marylebone, Prof. J. McIntosh, and Prof. W. B. Tuck. A primary F.R.C.S. course is held twice yearly, and also special classes to prepare students for the Intermediate Examinations of the Universities.

Scholarships and Prizes.—Two Entrance Scholarships, value £100 each, and two University Scholarships, value £90 and £60, are awarded annually in September. The successful candidates are required to become general students of the school. A Freer Lucas Scholarship is awarded annually on the nomination of the Headmaster of Epsom College. There are also two Broderip Scholarships, value £60 and £40 respectively; the Lyell Gold Medal and Scholarship, value £55 5*s.*; the John Murray Medal and Scholarship, value £25 (awarded every third year); the Freeman Scholarship, value £30; the Hetley Clinical Prize, value £25; the Leopold Hudson Prize, value 11 guineas; and the Second Year's Exhibition, value 10 guineas. There are numerous class prizes.

The Students' Amalgamated Clubs include the following: Medical Society, Common Room Society, Musical Society, cricket, football, rowing, chess, lawn tennis, hockey, sailing, and fencing. There are a restaurant and a gymnasium in the school buildings, and athletic grounds at N. Wembley. Squash racquets.

For further particulars apply to the Dean or the Secretary of the Medical School.

St. Thomas's Hospital.

This Hospital contains 644 beds. There are special departments for the treatment of women, children, diseases of the eye, ear, nose and throat, skin, teeth, and for orthopædics. Nervous and mental diseases are treated in special departments. An electrocardiograph has been installed for the investigation of diseases of the heart. The Tuberculosis Department forms a part of the Lambeth scheme for treatment of patients and for instruction. The Venereal Department has been established as part of the London County Council scheme. Departments for Radiology, Electrotherapy, Phototherapy, Massage and Remedial Physical Exercises are also special features. A speech clinic has been inaugurated in connexion with the Children's Department. Exceptional facilities are offered in the hospital laboratories for the study of General Pathology, Clinical Pathology, Chemical Pathology, and of Treatment by Serums and Vaccines. Surgical operations take place in the main theatres every day. Clinical teaching in the wards, out-patients' and special departments, is available every day of the week. Clinical lectures are delivered every Wednesday during the sessions. Clinical Units in Medicine and Surgery have been established.

All appointments in the hospital are open to students without extra fee. Clinical clerks and dressers for in- and out-patients are selected from students who have completed their third years' work. Every student acts as clerk in the post-mortem room and in one of the pathological laboratories, takes his turn on maternity duty under proper supervision in the maternity ward and district, thus obviating any necessity for seeking instruction elsewhere. Students are instructed in the administration of anæsthetics by the hospital anæsthetists.

The arrangements are made to meet the requirements of all the Examining Bodies. Special classes are held for the examinations at the University of *London* and for the First and Final Fellowship Examinations of the Royal College of Surgeons of England. Tutorial classes in all subjects precede the various examinations. The hospital is easily accessible from all parts.

Appointments.—A Resident Assistant Physician and a Resident Assistant Surgeon, salary £225 each per annum, and a Resident Anæsthetist, salary £200 per annum, are appointed annually. Three medical and four Surgical Registrars at a salary of £250 rising to £300 hold their appointments on a tenure renewable to a maximum of four years. A Pathological Registrar to the Department of Obstetrics and Gynæcology (at an annual salary of £250), an Ophthalmic Registrar (at an annual salary of £200), and an Orthopædic Registrar (unpaid) are appointed yearly. Eight Resident Casualty Officers and Anæsthetists are appointed every six months. Seven House Physicians (including two Obstetric House Physicians, and one House Physician to the Department of Diseases of Children), nine House Surgeons (including two Ophthalmic House Surgeons, one Orthopædic House Surgeon, and two House Surgeons to the Ear, Nose and Throat Department) are appointed every six months. Clinical Assistants in the Special Departments are appointed every three months, and hold office for six months if recommended for reelection. There are three Assistants in the Department of Pathology; the Senior receives £600 a year, and the two Juniors £450 each.

Scholarships and Prizes.—At this school there are the following Entrance Scholarships—namely, one in Arts, equivalent to the tuition fees for the first two years of study; two in Natural Science, of the value of £150 and £60 respectively; and the University Scholarship of £100 in any two of the following: Anatomy, Physiology, Pathology, Chemistry, also the "Hector Mackenzie" University Exhibition of the value of £60. The value of all entrance scholarships must be taken out in tuition fees. The money value and subjects of examination of the remainder are as follows: (*a*) William Tite Scholarship for second-year students, £25; (*b*) and (*c*) Musgrove Scholarship or (alternately) Peacock Scholarship each for third-year students and tenable for two years, £35 each; (*d*) Mead Medal, Medicine, Pathology and Hygiene; (*e*) Wainwright Prize, Medicine; (*f*) Toller Prize, Medicine; (*g*) Cheselden Medal, Surgery and Anatomy; (*h*) Clutton Memorial Medal in Clinical Surgery, biennial; (*i*) Beaney Scholarship, £50, biennially, Surgery and Surgical Pathology; (*j*) Solly Medal and Prize, biennial, Reports of Cases; (*k*) Sutton Sams Prize, biennial, Report of Cases; (*l*) Bristowe Medal, Pathology and Morbid Anatomy; (*m*) Hadden Prize, Pathology and Morbid Anatomy; (*n*) Grainger Testimonial Prize, £31 10*s*., Anatomy and Physiology; (*o*) Louis Jenner Research Scholarship, tenable for two years, £60 annually, Pathology.

St. Thomas's House, the New Students' Club, comprises spacious dining-, smoking-, and reading-rooms, and accommodation for some 60 resident students. There is no occasion for students to leave the hospital premises during working hours.

Further information may be obtained from the Secretary of the Medical School, St. Thomas's Hospital.

University College Hospital.

The final subjects in the curriculum are taught at the Medical School of the hospital, which has 526 beds, including 74 in the new obstetric hospital. The course of instruction is suitable for the examinations at the Universities of Oxford, Cambridge, Durham, and other British Universities, and for the medical education required by the Examining Board in England and the Society of Apothecaries. Clinical Units in Medicine, Surgery, and Obstetrics and Gynæcology are now in operation. The whole-time Directors of the Units are concerned with the organisation of the teaching generally, but the honorary staff are responsible for the largest share of the teaching in the wards and Out-patient Department of the hospital. The department of otology, rhinology, and laryngology (the Royal Ear Hospital) has been provided with a separate building in Hunter-street, adjacent to the obstetric hospital. It contains 39 beds, including eight private wards for patients of limited means. The hospital is equipped with all modern appliances for investigation. The new buildings of the Obstetric Hospital of 74 beds (rendered possible by the Rockefeller Benefaction), the new Residents' House (with accommodation for 30 residents and students), the extension to the Nurses' Home, and new research laboratories for the Medical School are now finished and in full occupation. Twelve women students are admitted annually.

Those who are desirous of carrying out original research in Pathology, including Morbid Anatomy, Bacteriology, Experimental Pathology, and Chemical Pathology, are admitted to work in the laboratories of the school by the Professor of Pathology, and under certain conditions can receive grants from the Charles Graham Medical Research Fund. In the Dental School in Great Portland-street, formerly known as the National Dental Hospital, there is afforded the opportunity for attending lectures and practical instruction in diseases of the mouth and teeth.

Appointments.—Clerkships and dresserships to the physicians, surgeons, anæsthetist, and pathologist are allotted amongst the students of the hospital. Maternity students are appointed each month and reside in the Students' House connected with the Medical School and Hospital. Sixteen house physicians, ten house surgeons, ten obstetric assistants, four house surgeons to the Royal Ear Hospital (of the total number of resident officers not more than three may be held by women students at any one time) are selected annually by examination from among the senior students who have a medical qualification. All house officers reside free in the hospital. In addition to these posts there are certain special appointments which are vacant from time to time and are filled by senior students of the hospital: Resident Medical Officer, Surgical Registrar, Medical Registrar, Obstetric Registrar, Harker-Smith Cancer Registrar, Ophthalmic Registrar, Registrar to the Royal Ear Hospital, Casualty Medical Officer and a Casualty Surgical Officer, Assistants in Ear and Throat, Skin and Venereal Diseases Departments, and House Anæsthetist.

Assistants to Medical, Surgical, and Obstetric Units.—These salaried appointments which have come into existence recently at the same time as the creation of the whole-time Chairs in Medicine, Surgery, and Obstetrics, are of great value to senior students who may desire to remain at Hospital after holding the ordinary resident appointments. They enable a man to continue clinical work and also to devote time to laboratory or other research, so as to fit himself for higher posts in the profession. The salaries range from £250 up to £600 a year, resident quarters being provided only for the chief assistant to the Obstetric Unit. The total number of such Assistantships varies from time to time, being generally about 12, and an aggregate sum of about £5000 annually is available for their salaries.

Scholarships and Prizes (those in connexion with University College have already been enumerated).—At this School the first two Scholarships (*a*) and (*b*) entitle the holder to a complete course at University College and University College Hospital Medical School; the second two (*c*) and (*d*) entitle to a final course at the Medical School. The money value and subjects of examination are as follows:—(*a*) Entrance Scholarship, Bucknill, 135 guineas, Chemistry, Physics, Botany, and Zoology; (*b*) Epsom Free Medical Scholarship, subjects of Preliminary Scientific Examination and Nomination by Epsom College; (*c*) and (*d*) two Goldsmid Entrance Scholarships, 112 guineas each, two of the following subjects: Anatomy, Physiology, General Pathology; (*e*) Goldsmid Entrance Exhibition, entitling holder reduction by £80 in the fees due for the full course of Final Medical Studies, two of the following subjects: Anatomy, Physiology, General Pathology; (*f*) Filliter Entrance Scholarship, entitling the holder to a reduction by £52 10*s*. in the fees due for the full course of Final Medical Studies; (*g*) Graham Scholarship in Pathology, £300 per annum for two years, awarded by the Senate of the University of London; (*h*) Atkinson Morley Scholarship, tenable for three years, £45 per annum, Surgery; (*i*) Atchison Scholarship, tenable for two years, £55 per annum, General Proficiency in Medical Studies; (*j*) Magrath Clinical Scholarship, about £150, Clinical Cases; (*k*) Percival Alleyn Scholarship, about £75, Surgery; (*l*) Filliter Exhibition, £30, Pathology; (*m*) Erichsen Prize, £21 1*s*., Practical Surgery; (*n*) two Senior and two Junior Fellowes Clinical Medals for Clinical Medicine; (*o*) two Liston Gold Medals for Clinical Surgery; (*p*) Alexander Bruce Gold Medal for Pathology and Surgery; (*q*) Tuke Silver and Bronze Medals for Pathology; (*r*) Radcliffe Crocker Travelling Scholarship for Dermatology; and (*s*) Leslie Pearce Gould Travelling Scholarship for Surgery. A limited number of Bursaries are available from the Atchison Fund, awarded at the discretion of the Dean, to enable students whose means do not allow to take Resident Posts.

The *Museum of Pathological Anatomy* is open for study daily, and microscopic sections of most of the specimens have been prepared and are available for the use of students on application to the Curator. The Anatomical Museum of the University of London, University College, is open to all students of University College Hospital and Medical School on the recommendation of the School Committee. The Medical Library, open daily to every student of the School, contains about 20,000 works on medical subjects, including all the current text-books and works of reference required for study or research.

The Medical Society of University College Hospital Medical School exists for the dual purpose (1) of promoting the study of medical and surgical science, and (2) of promoting social intercourse among its members. All male students of the Medical School are required to become members. Meetings are held once a fortnight for the purpose of discussing subjects connected with the study of medicine. In its social aspect the society includes various athletic clubs and superintends the gymnasium and squash racquet courts in the Medical School, and the Athletic Ground at Perivale.

University College Hall, Ealing, is recognised by the authorities as a residential hostel. The Students' House in University-street contains large and comfortable rooms. The Maternity Students occupy them on payment of a moderate charge.

Full information can be obtained from the Dean of the School.

Westminster Hospital.

The Hospital contains 248 beds, and has attached to it a Radium Clinic with 22 beds, elaborately equipped for all forms of Radium Therapy and Research. There are separate departments for diseases of the eye, skin, teeth, ear, nose and throat, for orthopædic practice, for diseases of women, for diseases of children, for radiography, for venereal disease, and for massage, electrical and light treatment. The anatomical, pathological, and materia medica museums are open to all students of the School.

The entire teaching of the Hospital is devoted to the subjects of the Final Examinations. Arrangements are made for the tuition required for Preliminary and Intermediate subjects.

Appointments: Paid appointments as Medical, Surgical, and Obstetric Registrars, Casualty Officers, House Physicians, House Surgeons, Anæsthetist, &c., are available for students when they have passed their examinations.

Research: There are excellent opportunities for Research work in the recently endowed John Burford Carlill Laboratories. Grants to assist Research workers are made annually from the John Burford Carlill Endowment.

Fees: Annual fee, £40. An entrance fee of 10 guineas includes membership of the Sports Union Club with its various branches—i.e., football, cricket, tennis, boxing, and Guthrie Society. The Athletic Grounds are situated in Tooting and are reached in 20 minutes from the hospital.

Scholarships and Prizes.—The following Entrance Scholarships are offered for competition: Winter Session: Two Scholarships in Anatomy and Physiology, £75 each. Summer Session: Two Scholarships in Anatomy and Physiology, £75 each. A certain number of Scholarships have been allotted to Universities of England, Wales, and the Colonies, and to Public Schools. These Scholarships are awarded entirely on the nomination of the principal of the university or school. During the period of study the following prizes may be competed for: Sturges Prize in Clinical Medicine, about £6, Reports on Cases; Chadwick Clinical Surgery Prize, £5, Reports on Cases; Chadwick Prize, £21 in books or instruments—Medicine and Surgery, including Pathology and Applied Anatomy and Physiology; Frederic Bird Medal and Prize, open to Fourth-year Students, £14 in medal and books or instruments—Midwifery, Diseases of Women, Medicine, Pathology, Forensic Medicine and Bacteriology, and Public Health and Toxicology; Abrahams Prize in Clinical Pathology 5 guineas, a Paper and Tests in Practical Work; Hanbury Prize in Diseases of Children, 10 guineas; Alfred Hughes Memorial Prize, open to Second-year Students, about £5 in books or instruments—Anatomy; Huxley Memorial Prize, 3 guineas in books or cash, open to Second-year Students —Physiology; Carter Gold Medal and Prize for Botany, open to Students of not more than three years' attendance, gold medal and books of the joint value of £15; Jelf Medal awarded to Third-year Students; Second-year Scholarship £20, Elementary Anatomy, Physiology, Histology and Organic Chemistry; Daniell Scholarship, £40, Chemistry; Rabbeth Scholarships open to First-year Students, one of £30 and one of £15; Class Examinations in the Preliminary Scientific Course. Inghley Prize in Pharmacology, £5, open to Students who within two years of passing the first examination for medical degrees have completed the course in Pharmacology. Hare Prize in Zoology, £2 10*s*., open to First-year Students. Inquiries should be addressed to the Dean of the Medical School.

London (Royal Free Hospital) School of Medicine for Women.

The Royal Free Hospital contains 280 beds. The Hospital also has large Casualty and Out-patient Departments. A Children's Department, including 18 cots, an Orthopædic Department, and a Light Department have recently been added to the Hospital. Maternity Districts are attached to the Unit operating in the Gray's Inn-road and Essex-road areas. Students also attend the in-patient and out-patient practice of the Elizabeth Garrett Anderson Hospital, Cancer Hospital, Hospital for Sick Children, Great Ormond-street, National Hospital, Queen-square, South London Hospital, and Royal London Ophthalmic Hospital.

A Clinical Unit in Obstetrics has been established controlling 68 beds. Courses are arranged for the Primary Fellowship Examination of the College of Surgeons. The Eastman Dental Clinic, for which Mr. George Eastman, of Rochester, N.Y., has provided the building fund, provides dental treatment. The course for dental students is in conjunction with the Royal London Dental Hospital, Leicester-square.

The School buildings have been entirely rebuilt in recent years, and there are spacious, well-equipped laboratories, which afford every facility for efficiency of teaching and practical work in all departments.

Students' chambers are provided in the neighbourhood of the school and the Warden can be consulted on the subject.

Students after qualification can hold the posts of house physicians, house surgeons, obstetric assistants, clinical assistants, assistant anæsthetist, medical, gynæcological, and surgical registrars, and assistant pathologist; and at the Medical School the posts of demonstrators in the departments of Anatomy, Physiology, Pharmacology, Biology, Chemistry, and Physics.

Scholarships and Prizes.—Among the larger of these awards are the following :—(*a*) Isabel Thorne Scholarship, £30. (*b*) St. Dunstan's Medical Exhibition, £60 a year, tenable for three or five years. (*c*) Mrs. George M. Smith Scholarship, £50 a year, tenable for three or five years. (*d*) Bostock Scholarship, tenable for two or four years, £90. (*e*) Mabel Sharman-Crawford Scholarship, tenable for four years, £20 a year. (*f*) Sir Owen Roberts Scholarship, £75 a year for four years. (*g*) Mabel Webb Research Scholarship, tenable for one year and renewable, £30; Physiology, Chemistry, or Pathology. (*h*) Fanny Butler Scholarship, tenable for four years; next award in July, 1931, £16. (*i*) John Byron Bursary, tenable for two years, for students already in the School requiring assistance for the prosecution of their medical studies; application to the Secretary by March 31st next, £20. (*k*) Helen Prideaux Prize and Julia Ann H. Cock Prize, to be spent in assisting the newly qualified holder to further study, £60 each. (*l*) Dr. Edith Pechey Phipson Post-graduate Scholarship of the value of £100, open to all medical women, preferably coming from India, or going to work in India. (*m*) Sarah Holborn Scholarship, value £20 a year for three or five years, awarded every alternate year; next award in 1931. (*n*) Dr. Margaret Todd Scholarship, tenable for four years, £37 10*s.* a year, awarded in alternate years; next award in July, 1931. (*o*) Lieutenant Edmund Lewis and Lieutenant Alan Lewis Memorial Scholarship, tenable for four years, awarded every four years; next award in July 1932. (*p*) Alfred Langton Scholarships, tenable two years, one awarded annually, £50 a year. (*q*) School Jubilee Bursary, tenable for three years, £50 a year. (r) Flora Murray Bursary, awarded every year to a fifth-year student, £50. The Dorothy Chick Gift, £20, is awarded annually for efficiency in Practical Midwifery. The Students' Union arranges the social, athletic, and other clubs and societies.

Inquiries may be addressed to the Warden and Secretary of the Medical School, 8, Hunter-street, London, W.C.

UNIVERSITY OF DURHAM.

The University of Durham grants degrees of Bachelor of Medicine; Bachelor of Surgery, Doctor of Medicine, Master of Surgery, Doctor of Surgery, Bachelor of Hygiene, Doctor of Hygiene, Bachelor of Dental Surgery and Master of Dental Surgery, a Diploma in Public Health, Diploma in Psychiatry, and a Licence in Dental Surgery.

For the degrees of *Bachelor of Medicine* and *Bachelor of Surgery* there are four professional examinations. The subjects of the First Examination are—Elementary Biology and Organic Chemistry. The subjects of the Second Examination are—Anatomy and Physiology. The subjects of the Third Examination are—Pathology and Bacteriology, Materia Medica, Pharmacology and Pharmacy, Medical Jurisprudence, and Public Health. The subjects of the Fourth Examination are—Medicine, including Therapeutics, Clinical Medicine, Surgery, Clinical Surgery, Operative Surgery, Midwifery and Gynæcology, Psychological Medicine, Diseases of the Skin, of the Throat, Nose, and Ear, and of Children, and Ophthalmology. It is required that at least one of the five years of professional education shall be spent at the University of Durham College of Medicine, Newcastle-upon-Tyne.

For the degrees of *Doctor of Medicine* and *Master of Surgery* a candidate must not be less than 24 years of age. He must also have obtained the degrees of Bachelor of Medicine and Surgery of the University of Durham, and must have been engaged for at least two years subsequently to the date of admission to these degrees in research work, or in attendance on the practice of a recognised hospital, or in the naval or military services, or in medical or surgical practice. The candidate for the M.D. degree may present an essay or undergo a special examination in the subjects of Medical Anatomy, Medical Pathology, and the Principles and Practice of Medicine. The subjects of examination for the M.S. are—Principles and Practice of Surgery, Surgical Pathology, Surgical Anatomy, Surgical Operations, Clinical Surgery.

Doctor of Medicine (without residence).—The University of Durham instituted a special examination whereby the degree of Doctor of Medicine may be obtained without residence. Candidates must not be under 40 years of age and must have been in active practice for 15 years as registered medical practitioners. They must also produce certificates of moral character from three registered members of the medical profession. The fee is 50 guineas (including the degree fee), of which 20 guineas is retained if the candidate fails to satisfy the examiners.

Attention is particularly directed to the fact that the Senate of the University on the 4th February, 1930, decided that this examination should not be held after June, 1932.

Doctor of Surgery.—The University of Durham grants the Degree of Doctor of Surgery. Candidates for this degree must be registered medical practitioners, and not less than 25 years of age. They must devote three years, subsequently to obtaining a registrable qualification, to the study of Surgery and ancillary subjects. One at least of the three years must be spent in the University. The candidate must submit to the Professor of Surgery the course of study he proposes to follow, and this course must be approved by the Board of the Faculty of Medicine. One year shall be devoted mainly to work in the departments of Anatomy, Physiology, Pathology, and Bacteriology, and the candidate must submit evidence of having so worked. Not less than six months of another year must be spent as resident surgeon in a recognised teaching hospital, and the rest of the year in the study of surgery in a recognised medical centre. Not less than six months of one of the three years must be spent in surgical study abroad.

Candidates for any of the above degrees, diplomas, or licence must give at least 28 days' notice to the Secretary of Examinations, University of Durham College of Medicine, Newcastle-upon-Tyne. In the case of the M.D. (essay) examination candidates must send in their essays before April 1st.

Scholarships and Prizes.—The following are awarded :—University of Durham Entrance Scholarship, £25 a year for four years; Pears' Entrance Scholarship, £10 a year for three years (awarded every third year); Heath Entrance Scholarship (from Kepier Grammar School), £60 (renewable); Province of Durham Masonic (Entrance) Scholarship, £60 (renewable); Heath Scholarship for Surgery, £200, available every second year; Rutherford Morison Surgical Scholarship, £180, available every third year

The following Scholarships are tenable for one year, namely :—Tulloch Scholarship for Elementary Biology and Organic Chemistry, £20; Dickinson Scholarship for Medicine, Surgery, Midwifery, and Pathology, Gold Medal and £20; Charlton Scholarship for Medicine, £25; Gibb Scholarship for Pathology, £28; Luke Armstrong Scholarship for Comparative Pathology, £25; Stephen Scott Scholarships for Anatomy and Physiology, two of £50 each; Philipson Scholarships for highest marks in Final M.B., B.S. Examinations, two of £35 each; Goyder Memorial Scholarship for Clinical Medicine and Clinical Surgery, interest on £325; Hamilton Drummond Memorial Scholarship, in aid of research in Clinical Surgery, about £50; Gibson Prize for Midwifery and Diseases of Women and Children, £10; Turnbull Prize and Silver Medal for Surface Anatomy; and Outterson Wood Prize for

Psychological Medicine, £10; Sewell Memorial Prize and Silver Medal for Clinical Pathology.

For further information apply to the Dean of the College.

Newcastle-upon-Tyne: College of Medicine.

Hospital practice is carried out at the Royal Victoria Infirmary, a general hospital containing more than 600 beds, and there are facilities for the study of the various special subjects.

Practical midwifery can be studied at the Princess Mary Maternity Hospital, which contains 90 beds, with an annual indoor and outdoor attendance on 3000 cases.

The bacteriological laboratory is adjacent to Armstrong College.

Post-graduate Instruction.—A comprehensive series of post-graduate courses have been arranged to enable practitioners to take advantage of the facilities for laboratory work and clinical study afforded by the College, the Royal Victoria Infirmary, and the Princess Mary Maternity Hospital; and in order to meet the varied requirements of practitioners there are general and special courses in the winter and summer sessions and an intensive course in the summer vacation.

A *Students' Union* has been erected and furnished at a cost of over £54,000, and is now in daily use. Special accommodation has been provided for women students.

Royal Victoria Infirmary.

The Infirmary has over 600 beds. Clinical Lectures are delivered by the Physicians and Surgeons weekly and ward demonstrations are given daily. Tutorial classes are given by the Assistant Physicians, Assistant Surgeons, the Medical and Surgical Registrars, and the Assistant to the Gynæcological Department, and demonstrations are given in the several out-patient departments daily. Pathological demonstrations are given by the Pathologist daily or as opportunity occurs, and in the new buildings nothing has been spared in perfecting scientific equipment. In addition to medical and surgical in-patient and out-patient departments the following special departments are fully equipped for teaching students: Ophthalmic, Throat, Nose, and Ear, Skin, and Venereal Disease, Gynæcological, and Electrical. The hospital building contains the following laboratories: 1. Special Pathological Laboratory, attached to the post-mortem rooms. 2. Bacteriological Laboratory in which all clinical bacteriological investigations are carried out. 3. There is in addition a Clinical Laboratory attached to each ward and to the out-patient department. There are five operating theatres in use in the hospital. The winter session of 1931 opens on Oct. 1st, and the summer session of 1932 on April 12th. Applications for detailed information should be made to the Sub-Dean, Dr. Horsley Drummond, at the hospital.

Appointments of assistants in the pathological and other special departments and of clinical clerks and dressers are made periodically. Resident appointments are also made every six months; and each year medical and surgical registrars (who also act as tutors) are appointed from candidates who have previously held resident appointments at any recognised hospital. These latter posts afford an excellent opportunity for post-graduate study, not only at the Infirmary, but also in the departments of anatomy, physiology, pathology, and bacteriology of the college.

Practical Midwifery is studied at the Princess Mary Maternity Hospital, which has 90 beds and a large extern department. Instruction is given in Psychological Medicine at the City of Newcastle Mental Hospital. A special course of instruction is given in the City Hospital for Infectious Diseases by the City Officer of Health.

Post-graduate Instruction.—1. General courses in Clinical Medicine, Surgery, and Pathology at the Royal Victoria Infirmary, meeting once weekly for ten weeks. One course will be held from October to December and one from April to June. 2. Special courses of clinical instruction, meeting once weekly for ten weeks, in the following subjects: Gynæcology; Diseases of the Eye; Diseases of the Throat, Nose, and Ear; Diseases of the Skin; Venereal Diseases; Neurology; Diseases of Children; Electrotherapeutics and Radiology; special courses in Midwifery will be held at the Princess Mary Maternity Hospital. 3. An intensive course of 14 days' duration in the early part of the Summer Vacation. 4. In addition to the regular post-graduate courses practitioners may attend the ordinary medical and surgical practice of the Royal Victoria Infirmary, and also at the Princess Mary Maternity Hospital, for specified periods.

UNIVERSITY OF BIRMINGHAM.

The University of Birmingham grants the degrees of M.B., Ch.B., M.D., Ch.M., and Ph.D. (for Research Study), and also a degree and a diploma in Public Health. The course for the Bachelors' degrees, including the subjects of Physics, Chemistry, and Biology, extends over six years. The Senate has power of recognising attendance at another University as part of the attendance qualifying for these degrees and of recognising examinations passed at such other Universities as exempting from the examinations in Physics, Chemistry, Biology, and Organic Chemistry; but at least three years must be spent in attendance upon classes in the University. The final year may be spent at any other medical school recognised by the University.

Degrees of Bachelor of Medicine and Bachelor of Surgery.—The student must have passed the Matriculation Examination of the Joint Board or an examination accepted in lieu thereof. Before commencing the study of Anatomy and Physiology, examinations in Chemistry and Physics and Biology must be passed (First M.B., Ch.B., Parts I. and II.), or examination in lieu thereof. All communications respecting the Matriculation Examination, and examinations accepted in lieu thereof, must be sent to the Secretary, Joint Matriculation Board, 315, Oxford-road, Manchester. Second Examination.—Part I., Organic Chemistry; Part II., Anatomy and Physiology. Third Examination.—General Pathology and Bacteriology. Fourth Examinations (at the end of the fifth year).—Forensic Medicine and Toxicology; Public Health; and Materia Medica, Pharmacology, and Therapeutics. Two years' hospital work must have been accomplished. Final Examination.—Medicine, Surgery, Midwifery and Diseases of Women, Mental Diseases, and Ophthalmology. Attendance at a general hospital for a year after the passing of the fourth examination will be required, also attendance at a fever hospital three months, maternity hospital three months, and mental hospital three months. Vaccination instruction must be taken and courses of Ophthalmology, Venereal and Skin Diseases, and Diseases of Ear, Nose, and Throat, Medical and Surgical Anatomy, and Operative Surgery. Distinctions may be awarded in the subjects (severally) of the Second, Third, Fourth, and Final; and First- and Second-Class Honours in the Final Examination.

Degrees of Doctor of Medicine and Master of Surgery. At the end of one year from the date of having passed the final M.B., Ch.B. examination the candidate will be eligible to present himself for the higher degrees of either Doctor of Medicine or Master of Surgery or both. Candidates have to present a thesis on some subject embraced in the medical curriculum, and pass a general examination in Principles and Practice of Medicine for the M.D. and one in Principles and Practice of Surgery, including operations on the cadaver, for the Ch.M., or, at the discretion of the examiners, in a special branch of Medicine or Surgery respectively. A thesis of exceptional merit may exempt from any part of these examinations, in which Honours may be awarded.

Degree of Ph.D.—The Degree of Doctor of Philosophy is conferred upon candidates who possess a medical degree of a British, Colonial, or other university approved of by the Senate of the University, and who have been engaged, to the satisfaction of the Medical Faculty, in advanced study and research for a period of not less than two years, either in a laboratory of the University or in one or more of the hospitals associated with the University. After the first year candidates may carry on research elsewhere, under approved conditions, and on completing the course present a thesis and submit themselves for oral and possibly written examination.

Scholarships and Prizes.—The following are awarded:—Entrance Scholarships: (*a*) Frank Fletcher and Catherine Fletcher Scholarships of £100 per annum each, for five years. Two or more offered annually; open to men and women students under certain prescribed conditions as to residence, &c.; (*b*) Sydenham Scholarship of £42, tenable for three years, award of Council to orphan sons of medical practitioners; (*c*) Sands Cox Scholarship of £21 per annum during two years, awarded to the candidate, not being more than 19 years of age, taking the highest marks at the Higher School Certificate Examination of the Joint Matriculation Board; (*d*) Dental Scholarship of £46 17*s*. 6*d*., Open Competitive Examination in subjects learned during apprenticeship; (*e*) Myers Travelling Studentship of £300, tenable for one year, offered in alternate years, awarded by vote of committee to M.B., Ch.B. candidates, tenable at some University or Hospital not in Great Britain or Ireland (available for year 1931–32); (*f*) two Ingleby Scholarships of £10 each, awarded to the candidates at Final Examination obtaining highest marks in the subjects of Midwifery and Diseases of Women; (*g*), (*h*), (*i*), and (*j*) Four Queen's Scholarships of £10 10*s*. each, awarded to the candidate taking the first place in the Second, Third, Fourth, and Final Examinations respectively, provided that the candidate's work is sufficiently distinguished; (*k*) Priestley Smith Prize in Ophthalmology, value about £6 10*s*., is awarded annually to the student passing the Final M.B., Ch.B. Examination on first entry who shows the best knowledge of Ophthalmology, provided the Examiners deem him worthy of this distinction; (*l*) George Henry Marshall Scholarship of £10, awarded annually, for the encouragement of Research Work in Ophthalmology; and (*m*) Russell Memorial Prize, a prize of books, value about £2, awarded annually to the Student who, not being of more than six years' standing as a student of the School of Medicine of the University, shall pass the best examination in the subject of Nervous Diseases. The "Arthur Foxwell Memorial Medal" (Gold Medal for Medicine) is awarded annually to the candidate taking the highest place in Clinical Medicine and passing the Final M.B., Ch.B. Examination in June; and the "Sampson Gamgee Memorial Medal" (Gold Medal for Surgery) is awarded annually to the best candidates passing Final M.B., Ch.B. Examination in June in Surgery (paper, oral, and clinical). The University Clinical Board awards Gold and Silver Medals on examinations in Medicine, Surgery, and Midwifery, respectively, in fourth and fifth years, open to all students.

Clinical Instruction.—The medical students of the University receive their clinical instruction by attending the amalgamated practice of the General Hospital, Queen's Hospital, Maternity Hospital, Children's Hospital, Mental Hospital, and Fevers Hospital, under the direction of the University Clinical Board. Appointments are open to students varying from £40 to £200 a year.

Post-graduate Instruction.—A "William Withering Lectureship" has been established. A course (or courses) of lectures is given annually for post-graduates on subjects chosen from year to year. In 1932 the Lectures will be given by Mr. G. J. Bond, C.M.G., F.R.C.S., F.L.S. The Ingleby Lectures on some subject in connexion with Diseases of Women and Children are given annually by specially appointed lecturers. The Lecturer for year 1932 is Prof. Seymour Barling, C.M.G., M.S., F.R.C.S. (Joint Professor of Surgery, University of Birmingham). Post-graduate Courses of Clinical Demonstrations for General Practitioners are arranged annually (April to July) at the Birmingham General, Queen's, and Children's Hospitals.

Queen's Hospital.

There is a close association of this Hospital (330 beds) with the University of Birmingham, and the University clinical teaching is conducted here, there being a wealth of excellent material. Ward rounds and out-patient clinic classes are held daily, and there are regular tutorial classes throughout the session. Post-graduate courses arranged by the University are conducted every year. There are special departments in Gynæcology, Diseases of the Eye, of the Ear, Nose and Throat, Dentistry, Radiology, Pathology, Bacteriology, Biochemistry, Physiotherapy, Electrocardiography, and Psychiatric Clinic associated with the Birmingham Mental Hospitals authorities. There are also large Wards for Midwifery and Postnatal cases, a Nursery for instruction in Infant Welfare, an extensive Midwifery District and residential facilities for students. There are 23 Resident Appointments (exclusive of Registrars) available each year for recently qualified students.

Birmingham General Hospital.

There are 484 beds. Special wards for Children, Gynæcological, Ear and Throat, Venereal, Maternity, and Septic cases; special beds for Eye and Skin cases. Laboratories for Bacteriology, Biochemistry, Cancer Research, and Morbid Histology. Separate rooms adjoin the medical and surgical wards for clinical pathology. Six operating theatres (one for outpatients and one for casualty department, which is a separate department), all designed and fitted on modern lines. In addition to clinical teaching given in the wards and out-patient department by the honorary staff, medical and surgical tutorial classes are held for senior and junior students. Clinical instruction in all the special departments, which include those for Radium, Electrotherapy, Electrocardiographic investigation, and Venereal Diseases. Post-graduate classes in every branch of medicine and surgery. The Jaffray Branch Hospital contains 61 beds.

Birmingham and Midland Eye Hospital.

There are 115 beds. Students attending for a period of three months will be granted certificates which will qualify for the University and Conjoint Board examinations. Post-graduate courses are available. A limited number of Non-Resident Clinical Assistants' posts are open to qualified practitioners, particulars of which can be had on application to the General Superintendent. This Hospital has a very large Out-Patient Department.

UNIVERSITY OF LIVERPOOL.

The degrees in the Faculty of Medicine are Bachelor of Medicine and Bachelor of Surgery (M.B. and Ch.B.), Doctor of Medicine (M.D.), Doctor in Philosophy (Ph.D.), Master of Surgery (Ch.M.), Master of Hygiene (M.H.), and Master of Orthopædic Surgery (M.Ch.Orth.).

Matriculation.—Candidates for the degrees in Medicine and Surgery are required (*a*) to have satisfied the examiners in the several subjects of the Matriculation examination or to have passed such other examination as may from time to time be recognised for this purpose by the Joint Matriculation Board; (*b*) to have included Mathematics among the subjects in which they have passed at such examination.

Degrees of Bachelor of Medicine and Bachelor of Surgery.—Candidates for the degrees of Bachelor of Medicine and of Surgery must have attained the age of 22 years on the day of graduation. At least two of the six years of medical study must have been passed in the University, and one year at least must have been passed in the University subsequently to the date of passing the First Examination. The other three years may be passed at any college or medical school recognised for this purpose by the University. Candidates must pass three examinations entitled respectively: the First Examination, the Second Examination, and the Final Examination. The subjects of the First Examination are: (1) Chemistry; (2) Biology (Zoology and Botany); (3) Physics; (4) Special Chemistry. The subjects of the Second Examination are: (1) Anatomy; (2) Physiology (including Physiological Chemistry and Histology). The subjects for the Final Examination are: (1) (*a*) Pathology, (*b*) Pharmacology and General Therapeutics; (2) (*a*) Forensic Medicine and Toxicology, (*b*) Public Health; (3) (*a*) Obstetrics and Diseases of Women, (*b*) Surgery, Systematic, Clinical, Operative, and Practical, including Ophthalmology, (*c*) Medicine, Systematic and Clinical, including Therapeutics, Mental Diseases, and Diseases of Children. Candidates may take Parts (1), (2), and (3) separately, provided that they do not present themselves for Part (3) until they have completed the sixth year of medical study.

Degrees of Doctor of Medicine and Master of Surgery. No candidate will be admitted to the degree of Doctor of Medicine or Master of Surgery unless he has previously received the Degrees of Bachelor of Medicine and Bachelor of Surgery, and at least two years have elapsed since he passed the examinations for those degrees. Candidates may also take the degree of Doctor of Medicine by examination after five years from taking Liverpool M.B., Ch.B. Candidates for the degree of Doctor of Medicine, who elect to present a thesis, are required (*a*) to present a thesis, acceptable to the Faculty, and certified to be the candidate's own work, together with (if the candidate desires) copies of published original papers upon Medical Science; (*b*) to present themselves for an oral examination on the subject of the thesis.

The subjects of examination for the Degree of Master of Surgery are: Surgery, Clinical Surgery, Operative Surgery, Surgical Pathology and Bacteriology, and Surgical Anatomy.

The University also awards a *Diploma in Medical Radiology and Electrology*—Part I., Physics; Part II., Radiology and Electrology. The parts may be taken at one examination or separately.

Scholarships, Fellowships, and Prizes.—The following are awarded: (*a*) Robert Gee Entrance Scholarship (Men), annually, of £42 10*s.*, tenable for four years; (*b*) Lyon Jones Scholarship, No. 1, of £21 per annum, tenable for two years, Competitive Examination among Junior Students in First M.B. Subjects; (*c*) Lyon Jones Scholarship, No. 2, of £21, Competitive Examination on results of Professional Examination in Anatomy and Physiology; (*d*) Derby Exhibition of £15, Competitive Examination in Clinical Surgery; and (*e*) Clinical School Exhibition of £15 in Clinical Medicine; (*f*) University Scholarship of £50 for one year, awarded on results of the Final (Part I.) Examination for the degrees; (*g*) Holt Fellowships, Physiology and Pathology, of £150 each, for one year; (*h*) Gee Fellowship, Anatomy, of £100, for one year; (*i*) John Rankin Fellowships in Anatomy, two, each of the value of £120, tenable for two years; (*j*) Johnston Colonial Fellowship, Biochemistry, of £100, for one year; (*k*) John W. Garrett International Fellowship, Bacteriology, of £100, for one year; (*l*) Thelwall Thomas Fellowship, Surgical Pathology, of £200, for one year; (*m*) Ethel Boyce Fellowship in Gynæcology, of £100, for one year; (*n*) Mary Birrell Davies Memorial Fund Scholarship, of the value of £60, tenable for four years, offered for competition in alternate years; open only to women students who will have attained the age of 19 on the first day of October next following the award; (*o*) Rankin Exhibition in Practical Anatomy, of £25, for one year; (*p*) Lady Jones Research Fellowship in Orthopædic Surgery, £200; (*q*) Samuels Memorial Scholarships, three at £20; (*r*) Ridgway Research Scholarship (£100); numerous prizes and medals.

The Medical School.—All the laboratories and class-rooms are situated close together, communicating with one another, and are made up of four large blocks of buildings which form one side of the College quadrangle. There are the Johnston Laboratories for Experimental Medicine and Biochemistry; the Medical School for Anatomy, Surgery, Toxicology, and Ophthalmology; and the Thompson-Yates Laboratories for Physiology and Pathology. There is also a separate building for Tropical Medicine. Medical research has also been endowed with several new laboratories in which students can pursue research work after graduation.

Clinical Studies.—The Clinical School of the University consists of four general hospitals—the ROYAL INFIRMARY, the DAVID LEWIS NORTHERN HOSPITAL, the ROYAL SOUTHERN HOSPITAL, and the STANLEY HOSPITAL; and of five special hospitals—the Eye and Ear Infirmary, the Hospital for Women (with the Samaritan Hospital), Liverpool Maternity Hospital, the Royal Liverpool Children's Hospital, and St. Paul's Eye Hospital. These hospitals contain in all a total of about 1500 beds. The organisation of these hospitals to form one teaching institution provides the medical student and the medical practitioner with a field for clinical education and study which is unrivalled in extent in the United Kingdom. All the hospitals are within easy access of the University. There are a large number of appointments to house physicianships and surgeonships both at the general and special hospitals which are open to qualified students of the school.

Public Health Department.—This is located in a separate building, in which full courses of instruction are given to students for the Diplomas and Degrees of the University and of other Examining Boards.

Prospectuses and further information may be had on application to the Dean of the Faculty of Medicine, University of Liverpool.

UNIVERSITY OF MANCHESTER.

Four degrees in Medicine and Surgery are conferred by the Victoria University of Manchester—viz., Bachelor of Medicine and Bachelor of Surgery (M.B. and Ch.B.), Doctor of Medicine (M.D.), and Master of Surgery (Ch.M.). A Diploma in Psychological Medicine, a Diploma in Public Health, a Diploma in Bacteriology, and a Diploma in Pathology, are awarded by examination to registered medical practitioners.

Degrees of Bachelor of Medicine and Bachelor of Surgery.—Before admission to the degree of M.B. or Ch.B. candidates are required to present certificates that they will have attained the age of 21 years on the day of graduation, and that they have pursued the courses of study required by the University Regulations during a period of not less than five and a half years subsequently to the date of their registration by the General Medical Council, two of such years having been passed in the University subsequently to the date of passing the first M.B. Examination.

The First Examination: (1) Chemistry and Physics; (2) (*a*) Botany, (*b*) Zoology. Candidates must have attended, during at least six months, courses both of lectures and of laboratory work in each of the above-named subjects. The Examination is divided into two parts: Part 1. Inorganic and Elementary Organic Chemistry and Physics; Part 2, (*a*) Botany, (*b*) Zoology. The candidates sit for these parts separately. The Second Examination: (1) Anatomy and Histology; (2) Physiology, including Physiological Chemistry. Both parts must be passed simultaneously. The Third Examination: (1) Pharmacology and Materia Medica; (2) Pathology and Bacteriology. The Final Examination: (1) Medicine, Systematic and Clinical (including Mental Diseases and Diseases of Children); (2) Surgery, Systematic, Clinical, and Practical; (3) Obstetrics and Gynæcology (including Clinical and Practical); (4) Forensic Medicine; (5) Hygiene and Preventive Medicine. The Final Examination is divided into two parts: Part I., Forensic Medicine, Hygiene and Preventive Medicine; Part II., Medicine, Surgery, Obstetrics and Gynæcology (Systematic, Clinical, and Oral). The two parts of the Final Examination must each be passed as a whole. Candidates for the Second Part must have completed the sixth year of medical study.

Degree of Doctor of Medicine.—Candidates are not eligible for the degree of Doctor of Medicine unless they have previously obtained the degrees of Bachelor of Medicine and Bachelor of Surgery of this University and at least one year has elapsed since they passed the examination for those degrees. Candidates may elect either (1) to present an original dissertation; or (2) to undergo an examination. The dissertation must embody the results of personal observation, or original research, either in some department of medicine or of some science directly relative to medicine. The examination, which will be written and practical, is in the Principles and Practice of Medicine, in Pathology, and in some other subject to be selected by the candidate.

Degree of Master of Surgery.—Candidates are not eligible for the degree of Master of Surgery unless they have previously obtained the degrees of Bachelor of Medicine and Bachelor of Surgery of this University, and at least one year had elapsed since they passed the examination for those degrees. The degree is conferred in the following branches: Surgery (Branch I.), Gynæcology (Branch II.), Ophthalmology (Branch III.), Laryngology, Otology, and Rhinology (Branch IV.).

Degrees of B.Sc. and M.Sc.—The ordinary degree of B.Sc. in the Schools of Anatomy and Physiology may be obtained by students in Medicine who in their third year of study for the degree of M.B., Ch.B., complete the additional courses in these subjects prescribed for this degree. Candidates for the Honours degree of B.Sc. in Anatomy or Physiology, who are students in Medicine, are required to attend courses in advanced Anatomy and Physiology for four terms after passing the Second Examination for the degrees of M.B., Ch.B. Graduates in science may proceed to the degree of M.Sc. by presentation of an approved thesis.

Diplomas: 1. The following are available for candidates holding a registrable qualification in medicine, surgery, and midwifery; examinations are in two parts in each diploma and are written, oral, and practical. Candidates may present themselves for Parts I. and II. separately or at the same time provided that no candidate be admitted to Part II. unless he has already passed in Part I. No candidate's name will be published until he has satisfied the examiners in both parts of the examination:—

(*a*) *Diploma in Psychological Medicine.*—Part-time course: extending over three University terms, two of which must be spent at the University. Six months' residence must be spent at a recognised Hospital for Mental Diseases.

(*b*) *Diploma in Public Health.*—The course extends over twelve calendar months at least: Part I. of the examination is held in June and October, and Part II. in March and October. Instruction for at least one of the parts must be taken out at the University. Holders of the Diploma in Public Health are eligible for examination for the Certificates in School Hygiene and Factory Hygiene after attending the prescribed periods of study and hospital practice.

2. *In Veterinary State Medicine.*—Length of course, three University terms. Candidates must be members of the Royal College of Veterinary Surgeons.

3. *In Bacteriology.*—For candidates who have graduated either in science or medicine, or obtained other approved qualification. Length of course, one academic year. A satisfactory thesis on an approved subject must be presented.

4. *In Pathology.*—For candidates who have obtained a registrable medical qualification or other qualification approved by the Senate. Length of course, one academic year. A satisfactory thesis on an approved subject must be presented.

Scholarships, Fellowships, and Prizes.—The following are offered in connexion with medical study at the Victoria University:—Scholarships: Dreschfeld Entrance (triennial), £20; John Russell Medical Entrance, £45; Sam Gamble Entrance for Women; Graduate Entrance (fees up to 100 guineas); two Dauntesey Medical Junior, £50 each; Dauntesey Medical Senior, £50; Professor Tom Jones Exhibition in Anatomy, £25; Dickenson Trust Scholarships in Anatomy and Pathology; Platt Physiological, £90; Graduate Research Scholarship, £70; Dickenson Trust Travelling Scholarships in Medicine and Surgery; Ashby Memorial in Diseases of Children (triennial), £100; Holt Post-Graduate Medical Scholarship for Women, £60; Elected Research Studentships; Fellowships: Leech Research, £70; Professor Tom Jones, Surgical, £105; Morrison Watson in Anatomy, £150; John Henry Agnew in Diseases of Children, £120; Delépine in Preventive Medicine (biennial), £300; Worswick (Causes and Treatment of Rheumatoid Arthritis), £300; Pilkington Fellowship in Cancer Research, £300; Zimmern Travelling Fellowship for Men, £175, also for Women; Knight Fellowship in Psychological Medicine; Honorary Research Fellowships. Prizes: Sidney Renshaw in Physiology—Junior £10, Senior £20; Wild Prize in Pharmacology, £10; Turner Medical, two prizes each of 10 guineas; Dumville Surgical, £15; John Henry Agnew in Diseases of Children, £30. There are many general entrance scholarships, in addition to those already mentioned, open for competition, the examinations for which are held in the month of May. Full particulars can be obtained from the Registrar.

The Medical School.—This school, largely extended in 1920, is provided with dissecting-rooms, X ray rooms, physiological laboratories, private laboratories, and work-rooms, besides lecture-rooms, museums, and general and departmental libraries. A special laboratory is equipped for experimental work on the central nervous system. In the pathological laboratories (now removed to special buildings close to the Royal Infirmary) ample provision is made for the teaching of pathology and bacteriology and for the prosecution of original research. The Helen Swindells Laboratory is specially equipped as part of a new department for investigation in cancer. Ample facilities for investigation are provided in Anatomy, Physiology, and Materia Medica; new Pharmacological Laboratories were added last year. In the public health department, which is lodged in a separate institute in York-place, near the Royal Infirmary, suitable laboratory accommodation is provided for the study of sanitary chemistry, physics, and practical bacteriology in the departments of chemistry and physics and in that of pathology.

Clinical Studies.—The clinical and practical departments of medical study are taught partly in the Medical School and partly in the Royal Infirmary and St. Mary's Hospitals for Women and Children, a fever hospital, mental hospitals, a convalescent home, and other special hospitals. Medical and Surgical Clinical Classes are conducted in the Infirmary, and separate instruction is afforded in the elements of Medical and Surgical Physical Diagnosis, in Obstetric Medicine, Ophthalmic Surgery, and Pathological Anatomy by the different members of the staff of the Medical School and Infirmary.

Post-graduate Studies.—Post-graduate Courses in the following subjects have been arranged for during 1931–32, in addition to those usually held at the various hospitals: 1. Whole-time intensive course in Obstetrics. 2. A Post-graduate Day. 3. Part-time courses in (i.) Diseases of the Eye, (ii.) Diseases of the Skin, (iii.) Practical Instruction in Local Anæsthesia and Minor Operative Surgery, (iv.) Practical Clinical Medicine. 4. Clinical Assistantships. 5. Radium Therapy. Syllabuses and other information may be obtained on application to the Dean of the Medical School, Manchester University.

Manchester Royal Infirmary.

The Manchester Royal Infirmary is built on the pavilion system, near the University, and has accommodation for 644 patients (including 54 beds at the Central Branch). The medical side consists of four units, each unit having a testing-room for the scientific investigation of morbid products and a class-room. The surgical beds are arranged in five units, each unit having its own operation theatre, with anæsthetising, recovery, sterilising, testing, and apparatus rooms, and its own class-room attached. All of these units are occupied. The gynæcological, aural, and out-patient departments each have their own operating theatre. Bacteriological investigations are carried out in a special clinical laboratory. A department for the study of heart disease, with an electric cardiograph and other instruments for research, diagnosis, and teaching purposes is attached to the medical wards. There is also a laboratory for clinical research. In the educational block is a large lecture theatre and a museum. In the same building is housed the X ray department, which has nine separate X ray outfits for different purposes, and in which one large room is put aside specially for X ray demonstrations and teaching purposes. A large massage school is also connected with this department.

Associated with the Infirmary are: (1) the Convalescent Hospital at Cheadle, containing 132 beds; and (2) the Central Branch in the City, which has accommodation for 54 patients. The Associated Hospitals thus contain 776 beds and are under the same management. Women students are admitted on the same terms as men.

Two Entrance Scholarships in Medicine of the value of £160 each are offered annually by the Council of the Manchester University and the Medical Board of the Manchester Royal Infirmary for proficiency in Arts and Science subjects respectively. Other scholarships and prizes are mentioned in the College syllabus. Numerous annual appointments and junior appointments may be held by those who have attended the practice of the Infirmary.

Royal Manchester Children's Hospital.

The hospital, which is situated at Pendlebury, near Manchester, contains 190 beds and 30 in the Convalescent Home, Lytham St. Anne's. The medical staff visit the hospital daily at 10 A.M. Clinical instruction is given by the medical staff at the Hospital and Dispensary, Gartside-street, Manchester. There is a Massage and Electrotherapeutic Department, also an Artificial Sunlight Department. Clinical Assistants are appointed for periods of six months. In throwing open these appointments to qualified medical men and women, the Board is actuated by the desire to aid those qualified medical men and women who wish to have opportunities for the further study of disease in children, or who wish to fit themselves for posts as Medical Officers to Children's Hospitals, to Child Welfare Centres, or for School Medical Officer appointments. There is an Orthopædic Department. Out-patients' day for which is on Tuesday, at Gartside-street, and a ward at Pendlebury is devoted to these cases needing operative treatment. Out-patients are seen daily at 9 A.M. at the Out-patient Department, Gartside-street, Manchester. Secretary: Mr. W. M. Humphry.

Ancoats Hospital, Manchester.

There are 114 beds with a Convalescent Branch of 35 beds at Great Warford, Alderley Edge, Cheshire. The hospital, founded in 1828, will be extended during the next two years by the addition of a new ward block, an operating theatre block, pathological department, physiotherapeutic department, and lecture theatre.

The medical division consists of three units served by consultative out-patient clinics. One unit includes a cardiological department; another devotes special attention to gastro-enterology; and the third to neurology. The surgical division comprises an orthopædic unit in which all the fractures and injuries of the hospital are treated; a unit devoted particularly to urology; a unit devoted to abdominal surgery; and an oto-laryngological unit. All units include out-patient clinics. A special clinic staffed by a team consisting of surgeons, pathologist, radiologist, and consultant in radium therapy has recently been created for the study and treatment of malignant disease. The demand on the surgical in-patient accommodation is great, 800 patients at the present time being on the waiting-list. Clinical teaching is given both to undergraduate and post-graduate students in all out-patient clinics, in the wards, and in the form of special lectures. The under-graduate teaching includes a University course in Orthopædic Surgery given in the Michaelmas term, and demonstrations on the examination of the ear, nose and throat. The hospital takes an important share in the University of Manchester Post-graduate scheme. A post-graduate "day," open to all practitioners without fee, is held on each Thursday in the University terms. Special intensive post-graduate courses are held from time to time. Applications for entry to these courses should be made to the Dean of the Faculty of Medicine, University of Manchester.

There are six residents: a resident surgical officer, a resident medical officer, three house surgeons, and one house physician. These appointments are open both to men and women graduates, and are recognised by the University of London for the purposes of the M.D. and M.S. degrees. There are also four registrar appointments (part time): medical, orthopædic, surgical, and pathological. These are made annually, and are renewable up to a period of three years. General Supt. and Secretary: Herbert J. Dafforne.

Manchester Northern Hospital for Women and Children.

The hospital, situated at Park-place, Cheetham Hill-road, Manchester, contains 73 beds. Out-patients are seen daily from 8.30 to 10 A.M.

UNIVERSITY OF LEEDS.

Four degrees in Medicine and Surgery are conferred—viz.: Bachelor of Medicine and Bachelor of Surgery (M.B. and Ch.B.), Doctor of Medicine (M.D.), Master of Surgery (Ch.M.), also Degrees and Diplomas in Dental Surgery and Diplomas in Public Health and in Psychological Medicine. Courses and Degrees in the Faculty are open to men and women alike.

Degrees of Bachelor of Medicine and Bachelor of Surgery.—Candidates for these degrees are required to present certificates showing that they will have attained the age of 21 years on the day of graduation, and have attended courses approved by the University extending over not less than five years, two of such years at least having been passed in the University, one of which must be subsequent to the date of passing the First Examination. Candidates must also satisfy the examiners in the several subjects of the following examinations, entitled respectively: the Matriculation Examination, or such other examination as may have been recognised by the Joint Matriculation Board in its stead; the First Examination; the Second Examination; and the Final Examination. The First Examination consists of: Part I., Physics and Inorganic Chemistry; Part II., Zoology and Botany; Part III., Organic Chemistry. Candidates will be allowed to pass the parts separately. The Second Examination consists of: Part I., Materia Medica and Practical Pharmacy; Part II., Anatomy Physiology. Candidates will be allowed to pass either part separately. The Final Examination consists of: Part I., Pharmacology, Pathology, and Bacteriology; Part II., Medicine, Surgery, Obstetrics, Gynæcology, and Clinical Pathology; Part III., Forensic Medicine, Public Health, and Therapeutics. Part I. may be taken at the end of the second clinical year, and Parts II. and III. may be taken at the end of the third clinical year, but not before the completion of the fifth year of medical study. If taken separately Part II. may be passed before Part III.

Degree of Doctor of Medicine and Master of Surgery.—Candidates are not eligible for the degree of Doctor of Medicine or Master of Surgery unless they have previously received the degrees of Bachelor of Medicine and Bachelor of Surgery of the University (or of Victoria prior to December, 1904) and at least two years' Hospital Practice or four years' other professional practice for the former, and one year has elapsed for the latter since they passed the examination for those degrees. Candidates for the degree of Doctor of Medicine may present a dissertation and, if the dissertation is considered to be of exceptional merit, will not be required to pass an examination. The first term commences on Oct. 1st. Prospectus can be obtained from the Academic Sub-Dean.

Post-graduate work.—Practitioners wishing to attend Infirmary practice during short periods, or post-graduate classes held by members of the clinical staff, may do so on application to the Clinical Sub-Dean, from whom particulars may be obtained.

Clinical Studies.—The clinical studies are pursued mainly at the LEEDS GENERAL INFIRMARY, which has accommodation for 630 in-patients, including 88 beds at branch hospitals in the country. Clinical teaching takes place daily in the wards, and Clinical lectures are given in Medicine and Surgery by the Physicians and Surgeons. There are Medical, Surgical, Ophthalmic, Aural, Electrotherapeutic, and Radiographic Departments, in each of which special instruction is imparted to students. Gynæcological and Children's Departments, together with Laryngeal, Venereal, and Skin Clinics, are in operation, and there is a special ward for cases of nutritional disorders of children. Several valuable prizes are given at the end of each session. Numerous appointments at the Infirmary are annually open to students after qualification. Further particulars concerning these, and the scholarships and prizes open to competition, may be obtained from the Dean of the Faculty of Medicine.

In addition to work in the General Infirmary, clinical instruction in obstetrics is given in the Leeds Maternity Hospital and in mental and infectious diseases in the Wakefield (W.R.) Mental Hospital and Leeds City Fever Hospital respectively.

UNIVERSITY OF SHEFFIELD.

The Degrees in the Faculty of Medicine are *Bachelor* of Medicine and Bachelor of Surgery (M.B., Ch.B.), Doctor of Medicine (M.D.), and Master of Surgery (Ch.M.), Bachelor of Dental Surgery (B.D.S.), and Master of Dental Surgery (M.D.S.). There is also a Diploma of Licentiate in Dental Surgery. The courses and degrees in the Faculty of Medicine are open to men and women alike. Candidates must matriculate in the University or pass such other examination as may be recognised for this purpose by the University and sanctioned by the Joint Matriculation Board, and must pass also the further examination in Chemistry and Physics.

Degrees of Bachelor of Medicine and Bachelor of Surgery.—A candidate must have attained the age of 22 years on the day of graduation, and have pursued the courses of study required by the University regulations during a period of not less than five and a half years subsequently to the date of his matriculation, three of such years at least having been passed in the Faculty of Medicine of the University one at least being subsequent to the passing of the Second Examination. The subjects of the First Examination are Chemistry, Physics, and Biology. Candidates who have passed the Intermediate Examination in the Faculty of Pure Science, including any or all of the subjects of the First Examination, will be considered to have passed the latter examination when they have passed in such of its subjects as they did not take for the Intermediate B.Sc. Examination. Such candidates shall be required to pay the fee for the First Examination. *Candidates must*, in addition to matriculation, pass a preliminary examination in Physics and Chemistry before taking *the First* Examination, for which they must have *attended* courses of instruction (lectures and laboratory work) in Chemistry, Physics, and Biology *for one year each.* The Second Examination: Candidates must have attended courses of instruction in Physiology (first part) for one year, and in Anatomy *for five terms.* The Third Examination: Candidates must have attended courses of instruction in Pathology for five terms, in Pharmacology for four terms (and one term in Pharmacy), in Applied Anatomy for four terms, and in Physiology (second part), for six terms. The Final Examination: The subjects are, Part I., Forensic Medicine and Public Health. Candidates must have attended courses for one term in each subject; Part II., Medicine (including Mental Diseases, Diseases of Children, and Vaccination), Special Pathology (including Morbid Anatomy and Clinical Pathology), and Therapeutics; Part III., Surgery (including the administration of Anæsthetics, Diseases of the Ear, Nose and Throat, Ophthalmology, and Surgical Pathology), and Obstetrics and Gynæcology, including Antenatal and Postnatal practice and Infant Hygiene. *Candidates for Parts II. and III.*, must have completed a minimum of five and a half years of approved study.

Degree of Doctor of Medicine.—Candidates for the degree of Doctor of Medicine must have passed the examination for the degrees of M.B., Ch.B. at least three years previously, must present a thesis embodying observations in some subject approved by the professor of medicine, and must pass an examination in the Principles and Practice of Medicine.

Degree of Master of Surgery.—Candidates must have taken the M.B., Ch.B. at least three years previously, and must since have held for not less than twelve months a surgical appointment in a public hospital.

The subjects of examination are Systematic, Clinical, and Operative Surgery, Surgical Anatomy, Surgical Pathology and Bacteriology.

Scholarships and Prizes.—The following scholarships are offered: Four Town Trustees scholarships offered annually, each of the value of £50 per annum for three years. Medical: offered annually, covers cost of tuition for a degree course in the Faculty of Medicine. Six Edgar Allen, offered annually, each of the value of £125 per annum for three years. Post-graduate: Frederick Clifford scholarship, value £50 per annum, tenable for two years. Mechanics' Institute scholarship, value £50 for one year with free admission to those University courses taken by the holder in connexion with his work, renewable for a second year. Town Trustees fellowship, value £75 for one year. Medals and Prizes: Kaye scholarship; Thomas Woodcock Prize; Gold Medal in Clinical Medicine and Surgery; John Hall Gold Medal in Pathology; Holroyd Gold Medal in Anæsthetics; the Walter S. Kay Gold Medal in Mental Diseases; bronze medals. Particulars of all the above may be obtained from the Registrar.

The Medical School.—The Medical Department occupies the entire north wing of the University quadrangle. The various athletic and other students' societies are under the management of the Union Representative Council, elected annually. There are large and comfortable common rooms both for men and women students, and two Students' Unions, one for men and one for women. A refectory is open daily at the University where students may obtain meals and refreshments at moderate prices. The University journal *The Arrows*, edited by a committee of staff and students, is published each term. The University Halls, "Oakholme," Clarkehouse-road; "Tapton Cliffe," Fulwood-road, and "Endcliffe University Hall," Endcliffe Vale-road, are recognised by the Senate as halls of residence for women students; full particulars may be obtained from the tutor for women students. Stephenson Hall is a hall of residence for men students; particulars may be obtained from the Warden.

Clinical Studies.—The University is within easy reach of the various hospitals with which it is connected for clinical purposes.

The Sheffield Royal Infirmary (500 beds) provides all the opportunities of a large general hospital with special departments for Skin and Ear. The Sheffield Royal Hospital, 340 beds, has special out-patient departments for Diseases of the Throat, Ear, Skin, Orthopædics, and Mental Diseases. The two institutions are amalgamated for the purposes of clinical practice, medical, surgical, and special. There are special departments for the treatment of Diseases of the Eye, with wards assigned to them, at both hospitals, and excellent junior appointments. The Jessop Hospital for Diseases of Women, with 146 beds, has also a Maternity department, with about 900 in-patients per annum and about 3000 out-patient cases attended. The Children's Hospital has 92 beds. Special courses on Fevers are held at the City Fever Hospitals (988 beds) and on Mental Diseases at the South Yorkshire Mental Hospital (1900 beds). Every facility is afforded in the various laboratories for the prosecution of advanced studies and research.

Post-graduate Courses.—Post-graduate courses of clinical instruction are held annually in the various hospitals connected with the School.

UNIVERSITY OF BRISTOL.

In the Faculty of Medicine there are the following degrees:—Bachelor of Medicine and Bachelor of Surgery (M.B. and Ch.B.), Doctor of Medicine (M.D.), Master of Surgery (Ch.M.), Bachelor of Dental Surgery (B.D.S.), and Master of Dental Surgery (M.D.S). There are also the following diplomas: Diploma in Public Health (D.P.H.), Diploma in Dental Surgery (L.D.S.), and Diploma in Veterinary State Medicine.

All candidates for degrees in Medicine, Surgery, and Dentistry are required to pass, at Matriculation standard, an examination called the School Certificate Examination, or to pass such examination as may be regarded as equivalent by the Senate. All courses, degrees, and diplomas are open to men and women.

Degrees of Bachelor of Medicine and Bachelor of Surgery.—Candidates shall be not less than 21 years of age and shall have pursued the courses prescribed by University Regulations during not less than five years after passing the first examination in Chemistry and Physics and entering on the professional curriculum at the University, or an institution recognised as equivalent, of which three shall have been passed in the University, and two of these three subsequent to passing the second examination. All candidates for the degrees of M.B., Ch.B., are required to satisfy the examiners in the several subjects of three examinations. The First Examination: The subjects of examination are: Chemistry (Inorganic), Physics, and Biology, the courses pursued being those for the time being approved for the intermediate part of the B.Sc. curriculum. This part of the curriculum shall extend over one year. (Candidates who have passed the Higher School Certificate approved by the Board of Education in these subjects will not be required to sit for the first examination and will be regarded as having completed one year of study.) The Second Examination: The subjects of examination are: Organic Chemistry and Elementary Anatomy (Part I.) and Advanced Anatomy and Physiology (Part II.). The Final Examination: The subjects of examination are: Materia Medica and Pharmacy, Pharmacology and Therapeutics, General Pathology, Morbid Anatomy, and Bacteriology (Part I.); Special Pathology, Forensic Medicine and Toxicology. Public Health, Obstetrics (including Diseases of Women), Surgery (Systematic, Clinical, Practical, and Operative), Medicine (Systematic, Clinical, and Practical, including Mental Diseases) (Part II.). The subjects included in Part II. may be taken in two groups—viz., Group I., Surgery and Obstetrics; Group II., Medicine, Public Health, Special Pathology, Forensic Medicine and Toxicology. Candidates may pass Parts I. and II. together, or separately, and the two groups of Part II. may be taken together or separately. Forensic Medicine and Toxicology may be taken with Part I., or with Group II. of Part II.

Degree of Doctor of Medicine.—Candidates shall be Bachelors of the University of not less than two years' standing as such and may elect either (1) to pass an examination in General Medicine, or (2) to pass an examination in State Medicine, or (3) to present a Dissertation. The candidate who elects to pass the examination in State Medicine must hold a diploma in Public Health of some University or College, and the candidate who elects to present a Dissertation may be examined in the subject thereof.

Degree of Master of Surgery.—The degree may be taken in General Surgery or in Special Subjects. Candidates shall be Bachelors of not less than two years' standing as such. For General Surgery, they shall pass an examination in Surgical Anatomy, Pathology, and Bacteriology, and in Operative, Clinical, and General Surgery, and shall present a dissertation. For Special Subjects—i.e., Ophthalmology or Oto-rhino-laryngology or Gynæcology, they shall, in addition to having studied and practised for two years the subject concerned, have held an approved appointment in it for not less than six months; they shall pass a written, oral, and clinical examination in the branch of Surgery concerned, as well as in the Anatomy, Physiology, and Pathology of the region of the body concerned (including in the case of Ophthalmology Physiological optics) and also a written examination in the principles of General Surgery.

Clinical Studies.—The allied hospitals (Bristol Royal Infirmary and Bristol General Hospital) have between them about 660 beds and extensive out-patient departments, special clinics for Diseases of Women and Children and those of the Eye, Throat and Ear, in addition to large and well-equipped departments for Dental work and large outdoor Maternity Departments. The Bristol Royal Infirmary has now been selected by the National Radium Commission as a Radium Centre.

At each of these institutions there are well-arranged pathological museums, post-mortem rooms, and laboratories for Morbid Anatomy. There are also laboratories for work in Clinical Pathology, Bacteriology, and Cytology, in which special instruction is given in these subjects. Departments are provided and well equipped for X ray work, both for diagnosis and treatment, the various forms of Electrical treatment, including High-frequency Currents, Electric Baths, Finsen Light treatment, and Massage.

The students of the school also attend the practice of the Royal Hospital for Sick Children and Women, containing 100 beds, and that of the Bristol Eye Hospital with 40 beds. Other institutions, including the Bristol Mental Hospital, Southmeed Hospital, Ham Green Fever Hospital, Stoke Park Colony for mental defectives, and the Winford Orthopædic Hospital, are also available for their special purposes.

There are numerous salaried junior appointments for residents who are graduates.

Scholarships and Prizes.—The following are awarded: The Ashworth Hallett Scholarship, value £40, open to women only; two Martin Memorial Pathological Scholarships of £10 each; the Tibbits Memorial Prize, value 7 guineas, for proficiency in practical surgery; the Committee's Gold and Silver Medals for fifth-year students for general proficiency; the Augustin Prichard Prize, value about 6 guineas, for proficiency in anatomy; the Henry Clark Prize, value 11 guineas, for proficiency in gynæcology; the Crosby Leonard Prize, value 6 guineas, for proficiency in surgery; the Suple Surgical Prize, a gold medal and 7 guineas; the Suple Medical Prize, a gold medal and 7 guineas; the Henry Marshall Prize, value £12, for dressers; the H. M. Clarke Scholarship, value £15, for proficiency in surgery; the Sanders Scholarship, value £22 10*s*., for general proficiency; the Barrett-Roué Scholarship for proficiency in diseases of the eye, ear, nose, and throat, value £17; Lady Haberfield Scholarship, value about 25 guineas;

the Paul Bush Gold Medal in alternate years to best Resident Medical Officer at Royal Infirmary; Markham Skerritt Memorial Prize, awarded every three years to that member of University, not a member of Medical Board, who, in opinion of that Board, has published the best original work during the three years.

Bristol City Senior Scholarships and those offered by the Counties of Gloucestershire, Somerset, Wilts, and Dorset, and the City of Bath are tenable in the University. The Beaverbrook Fellowship and some of the Fellowships awarded by the Colston Research Society for research in the University are allotted to the Faculty of Medicine.

Post-graduate Study.—Qualified medical practitioners may be appointed as clinical assistants for a period of one or more months. They may act as assistants, if times permit, in more than one department and in any of the hospitals during their period of study. They will be entitled to the use of the clinical laboratories and medical library, and have the right to attend in all departments, including operations, post-graduate and ordinary clinical demonstrations, and post-mortem examinations. Demonstration courses with weekly lectures are held from October to June inclusive.

All inquiries and applications for admission should be addressed to the Director of Post-graduate Studies (Clinical Section), Pathological Department, University of Bristol, who can be seen on any day by appointment.

Further information as to scholarships, curricula, and fees can be obtained from the Dean of the Faculty of Medicine or the Registrar of the University.

UNIVERSITY OF WALES.

The University grants Degrees in Medicine, and Diplomas in Public Health and Tuberculous Diseases. Preliminary courses of study for the Degrees in Medicine may be pursued at any of the constituent Colleges of the University—viz., at Aberystwyth, Bangor, Cardiff, or Swansea. The Welsh National School of Medicine is situated in Cardiff. All classes are open to both men and women students.

Particulars may be obtained on application to the Registrar of the University of Wales, University Registry, Cathays Park, Cardiff, or to the Secretary, Welsh National School of Medicine, The Parade, Cardiff.

ENGLISH MEDICAL CORPORATIONS GRANTING DIPLOMAS.

CONJOINT EXAMINING BOARD.

Under this heading we give the regulations for the examinations enjoined by the Conjoint Examining Board of the Royal Colleges of Physicians of London and Surgeons of England, and of the Society of Apothecaries upon students desiring their respective diplomas of qualification. We do not give any list of schools recognised by these bodies as eligible to prepare students for their examinations beyond mentioning that all the schools which we have already described (under the heading of the Universities to which they are attached) are recognised as suitable places of instruction by the corporations granting medical diplomas. The courses of study at the principal colonial medical schools are also recognised as qualifying for the examinations of these corporations.

Students are required to pass a Preliminary Examination in General Education recognised by the Board, and a *Pre-Medical Examination* in Chemistry, Physics, and Elementary Biology conducted by the Conjoint Examining Board before commencing the five years curriculum of professional study or some other examination recognised by the *Board*—namely, the examination in Chemistry, Physics, and Biology for the degree in Medicine of any University recognised by the Board; the Higher School Certificates of Oxford and Cambridge Universities, and the Oxford and Cambridge Schools Examination Board; the Higher Certificates of London, Bristol, Durham Universities, the Joint Matriculation Board of the Northern Universities, and the Central Welsh Board Higher Certificate. A candidate must enter for Chemistry and Physics together, and he will not be allowed to pass in one without obtaining at the same time at least half the number of marks required to pass in the other subject. Not more than two terms of professional study (Anatomy and Physiology) will be recognised before Elementary Biology is passed. He will be admitted to the examination on producing evidence of having passed the required preliminary Examination in General Education. The examination is partly written, partly oral, and partly practical. A candidate rejected in one or both subjects of the examination will not be admitted to re-examination until after the lapse of a period of not less than three months. The fee for the examination is £4 4*s.*, for re-examination in Chemistry £2 2*s.*, re-examination in Physics £1 1*s.*, and re-examination in Biology £1 1*s.*

There are two Professional examinations called the *First* and *Final Examinations.* The courses of study for these examinations may be commenced before the Pre-Medical examination in Biology or some equivalent examination has been passed, provided that three terms of study are completed after the examination has been passed.

The subjects of the First Professional Examination are: Section I. (*a*) Anatomy, including Histology and Embryology. (*b*) Physiology, including Biochemistry. Section II. Pharmacology and Materia Medica. A candidate must have attended at a recognised Medical School courses of instruction in Anatomy, including Embryology, during five terms, during which he must have dissected the whole body, courses of instruction in Physiology, including Biochemistry during five terms, courses of instruction in Pharmacology, and Materia Medica. A candidate may present himself for the two Sections together or separately, but he must take parts (*a*) and (*b*) of Section I. together until he has passed in one or both parts, but a candidate will not be allowed to pass in one part unless he obtains at the same time at least half the number of marks required to pass in the other part.

Section II. of the examination may be passed at any time before the candidate enters for the Final Professional Examination, provided that the courses for Section I. have been completed. The fee for the First Professional Examination is £10 10*s.*, for re-examination after rejection in Section I. £6 6*s.*, for re-examination after rejection in either part of Section I. £3 3*s.*, for re-examination after rejection in Section II. £3 3*s.* A candidate who produces satisfactory evidence of having passed an examination in the subjects of Section I. or of either part of Section I. and of Section II. in the examination for the degree in Medicine conducted at a University recognised by the Board will be exempted from further examination in such subjects.

Final Professional Examination.—The subjects of the Final Professional Examination are: Section I. Pathology (including Morbid Anatomy, Morbid Histology, and Clinical Pathology), and Bacteriology. Section II. Part I. Medicine, including Medical Anatomy, Forensic Medicine and Public Health. Part II. Surgery, including Surgical Anatomy and the use of Surgical Appliances. Part III. Midwifery and Gynæcology. The examination is partly written, partly practical, partly clinical, and partly oral. A candidate may take Sections I. and II. and the three parts of Section II. of the Final Examination separately or may take the whole examination together. He will be required to produce the certificates required by the regulations before being admitted to the respective parts of the examination. The fee for admission to Section I. is £4 4*s.*; for admission to Section II., Part I., £10 10*s.*; Part II.,

£10 10*s.*; Part III., £6 6*s.*; and the re-examination fees are respectively £3 3*s.*, £6 6*s.*, £6 6*s.*, and £4 4*s.* Members of recognised universities outside the British Possessions are admissible to the examinations of the diplomas of L.R.C.P. and M.R.C.S., under special conditions. Graduates in medicine and surgery are required to pass the first examination and to complete 12 months hospital practice before admission to any part of the final examination. Undergraduates are required to complete the full curriculum of 33 months for the final examination after having passed the first examination. For further information see the current regulations of the Conjoint Examination Board in England.

Members of certain recognised Indian, Colonial, and Foreign universities who have passed examinations for the Degree of Doctor or Bachelor of Medicine or Surgery in the subjects of the First Examination may present themselves for the Final Examination under special conditions. The Board also grants Diplomas in Public Health, in Psychological Medicine, in Ophthalmic Medicine and Surgery, in Tropical Medicine and Hygiene, in Laryngology and Otology, and in Gynæcology and Obstetrics. Candidates must hold a Medical qualification registrable in the United Kingdom or be Graduates in Medicine of a recognised Indian, Colonial, or Foreign University. Particulars and conditions of admission to all examinations, fees, &c., may be obtained from the Secretary of the Examining Board, Examination Hall, Queen-square, London, W.C.1.

ROYAL COLLEGE OF PHYSICIANS OF LONDON.

THE MEMBERSHIP AND FELLOWSHIP.

The College confers two separate diplomas—the *Fellowship*, a purely honorary distinction, and the *Membership*, obtained by examination.

Membership.—The age for admission to this diploma, it will be noticed, has been changed from 25 to 23 years. The alteration in the by-law of the College is designed to enable men who have just finished house appointments to sit for an examination for which their recent clinical experience has exactly fitted them. The candidate must either have obtained the licence of the College, or a degree of Doctor or Bachelor of Medicine at a University which is registrable by the General Medical Council and is recognised by the Censors Board. The examination is directed partly to pathology and partly to the practice of medicine. Credit is also given to candidates who show a knowledge of Latin, Greek, French, or German. Further information may be obtained from the Registrar at the College. The fee for admission as a Member of the College is 40 guineas, except when the candidate for membership is a licentiate of the College, in which case the fee already paid for the licence is deducted from the 40 guineas. The fee for the examination is 10 guineas, which is reckoned as part of the fee for admission in the case of success.

Fellowship.—Fellows are selected annually from the ranks of Members by the Council of the College.

ROYAL COLLEGE OF SURGEONS OF ENGLAND.

THE FELLOWSHIP.

The Royal College of Surgeons of England confers its diploma of Fellow upon a few distinguished persons in an honorary capacity. Two Members of long standing may also be elected to the Fellowship annually. But the bulk of the Fellows obtain the diploma as the result of examination.

Fellowship.—The examination for the Fellowship is divided into two parts—viz., the First Examination and the Second Examination. The subjects of the First Examination are Anatomy and Physiology and those of the Second Examination are Surgery, including Surgical Anatomy and Pathology. The examinations are partly written and partly vivâ voce, and include the examination of patients and the performance of operations on the dead body. The First Examination is held in June and December and the Second Examination in May and November.

The fees for examination are: First Examination, first admission 8 guineas, and for each readmission 5 guineas. Second Examination, each admission 12 guineas. The fee payable on admission to the Fellowship by Members is 10 guineas and by non-Members 30 guineas, in addition to examination fees.

A Member of the College is admissible to the First Examination at any time after receiving his Diploma of Membership. A candidate who is not a Member is admissible after passing the First Professional Examinations of the English Conjoint Board in Anatomy and Physiology, or the equivalent examination in his University, on the production of certificates of attendance upon prescribed courses.

A Member of the College is admissible to the Second Examination at any time after having passed the First Examination on producing evidence of having been engaged not less than six years in the study (or study and practice) of the profession.

A candidate who is not a Member of the College must possess the registrable surgical and medical degrees of universities recognised by the Council and must have been engaged in the study (or study and practice) of the profession for not less than four years subsequent to the date of obtaining the recognised qualification, one year of which shall have been spent in attendance on the Surgical Practice of a recognised hospital. The diploma of Fellow is not conferred upon successful candidates until they have attained the age of 25 years.

The Regulations may be obtained on application to the Director of Examinations, Examination Hall, Queen-square, London, W.C.1.

BRITISH COLLEGE OF OBSTETRICIANS AND GYNÆCOLOGISTS.[1]

The College was founded and incorporated in September, 1929. The objects of the College are set forth in the Memorandum of Association. The first, a very important object, is "To encourage the study and practice of Obstetrics and Gynæcology, subjects which should be inseparably interwoven."

The College consists of Fellows and Members, and has power to take part in the Examination of Candidates for admission to the British Register of Medical Practitioners, in coöperation with teaching and/or examining bodies authorised to conduct medical examinations for the purpose of qualifying candidates for admission to the British Register of Medical Practitioners, if invited by such bodies. It also has power to grant diplomas and certificates in Obstetrics and Gynæcology, either alone or in coöperation with teaching and/or examining bodies authorised to grant such diplomas.

Candidates for the Membership of the College have to show evidence of having held resident appointments in general medicine or surgery, and also in Obstetrics and Gynæcology, before entering for the examination. The Fellowship of the College is granted to those Members who are judged by the College to have advanced the science and art of Obstetrics and Gynæcology. The Fellowship and Membership of the College includes practically every teacher of Obstetrics and Gynæcology in Great Britain, and many distinguished exponents in the British Dominions.

It is hoped that in a few years' time one of the essential qualifications for election to the staff of all departments of Obstetrics and Gynæcology in general and in special hospitals will be the Fellowship or Membership of the College. Consequently, all intending to specialise in these subjects should endeavour to obtain as soon as possible the Membership, the conditions and regulations of which may be obtained from the Hon. Secretary, Prof. W. Fletcher Shaw, 20, St. John-street, Manchester.

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[1] The British College is placed with the English Corporations, but its advantages are open, as are those of the English Colleges to all who can comply with the regulations.

SOCIETY OF APOTHECARIES OF LONDON.

The Pre-Medical and Primary Examinations are held quarterly. The Pre-Medical includes Chemistry, Physics, and Elementary Biology. The Primary includes Anatomy, Physiology, and Histology, Materia Medica, and Pharmacy. The latter examination cannot be passed before the completion of 12 months' Practical Anatomy with Demonstrations, and the first two subjects cannot be taken separately except in the event of the candidate having previously passed in one.

The Final Examination for the Licence (L.M.S.S.A. Lond.) is held monthly, except in September. (*a*) Principles and Practice of Surgery, including Surgical Pathology, Surgical Anatomy, Operative Manipulation, Instruments and Appliances. (*b*) Principles and Practice of Medicine, including Therapeutics, Pharmacology, Pathology, Bacteriology, and Morbid Histology. (*c*) Midwifery, Gynæcology, Diseases of New-born Children, and the Use of Obstetric Instruments. (*d*) Forensic Medicine, Hygiene, Mental Diseases, and the Theory and Practice of Vaccination. The examination is partly written, partly practical, partly clinical, and partly oral. Sections *a*, *b*, *c*, and *d* may be taken at separate examinations, but there is no exemption from any part of the Final Examination. (A separate examination in Pathology will be instituted during the current year.)

The minimum period of medical study extends over five years, and three academic years (33 months) must elapse after a candidate has passed the examination in Anatomy and Physiology before he can complete the *Final Examination*. The course of study for the Final Examination includes attendance on the Surgical and Medical Practice with Post-mortem Examinations, at a hospital connected with a medical school for a period of three winter and three summer sessions, including a course of Practical Midwifery, with attendance on 20 Midwifery cases. The office of dresser or clinical clerk must have been filled at a hospital or institution recognised by the Society.

The certificates prescribed by the Regulations must be produced before admission to the respective sections of the Final Examination.

Candidates intending to present themselves for examination are required to give 14 days' notice. The fee for the Pre-Medical Examination is five guineas, and for the Licence 20 guineas, which may be paid in two instalments of ten guineas.

Master of Midwifery.—The examinations for this Diploma are held in May and November. Candidates will be admitted to the examination who have been registered practitioners for at least one year and who have held a resident appointment in an institution recognised by the Society for six months or more, and who for three months in each case have attended an antenatal clinic and an infant welfare centre, also recognised by the Society. Medical officers employed by a public health authority, and having special duties connected with Maternity and Child Welfare, will be admitted to the Examination on production of evidence to that effect. Until 1932 practitioners of ten years' standing may enter for the examination without further formality than the production of satisfactory evidence that they have made a special study of the subjects The examination will be conducted by written papers and by clinical and oral tests.

The entrance fee for the examination is £10 10*s*., and a further fee, which at present is fixed at £10 10*s*., must be paid before admission to the Mastery by those who have satisfied the examiners.

Candidates for the examination must send in their certificates to the Registrar, who will supply any other information.

The examination offices are open from 10 A.M. to 4 P.M.; on Saturdays from 10 A.M. to 1 P.M. All letters should be addressed to the Registrar, Society of Apothecaries of London, Blackfriars, E.C.4.

METROPOLITAN CENTRES AFFORDING POST-GRADUATE FACILITIES.

Certain organisations and institutions provide for the needs of the medical student in his curriculum and for the post-graduate student requiring special forms of instruction and opportunities for clinical observation. Many of the institutions are recognised by the English Conjoint Examining Board as a place of study for the fifth year of the curriculum.

Special Diplomas in public health, tropical, psychological, and ophthalmic medicine, medical radiology and electrology, laryngology, otology, and tuberculosis are now granted in proof of intensive work along the different lines indicated. Of these, the Diploma in Public Health, being regulated by the General Medical Council, is registrable. Appointments to and promotion in the various Services are largely dependent on the possession of a particular diploma, and each syllabus of the special courses available at the institutions which follow, either with or without association with the Fellowship of Medicine, is planned to afford the necessary instruction.

The Special Diplomas are dealt with fully on p. 495, where the Bethlem Royal Hospital, the Maudsley Hospital, and the Diploma in Psychological Medicine are referred to. Similarly the Hospitals of the Metropolitan Asylums Board provide post-graduate as well as under-graduate facilities, while the hospitals of the Seamen's Hospital Society both supply the instruction necessary for the Diploma in Tropical Medicine and Hygiene, and coöperate in the activities of the Fellowship of Medicine and Post-Graduate Medical Association.

Infectious Hospitals of the London County Council.

These hospitals, of which there are 18 in the metropolis and the near vicinity, were transferred on April 1st, 1930, to the Council from the Metropolitan Asylums Board, which ceased to exist on March 31st, 1930, under the provisions of the Local Government Act, 1929. The Council holds classes of instruction in fevers at all the infectious hospitals at which ordinary medical students attend, but the only hospitals to which classes of instruction for the Diploma in Public Health are attached are the North Western Hospital and the Brook Hospital. This course of lectures and demonstrations (three months) on clinical practice and in hospital administration is given at the North-Western Hospital, Lawn-road, Hampstead, N.W.3, by the medical superintendent, on Mondays and Wednesdays, at 4.45 P.M., and alternate Saturdays at 11 A.M., beginning Wednesday, Oct. 1st. This course complies with the requirements of the revised D.P.H. regulations of the General Medical Council. Application for further information should be made to the Medical Officer of Health, London County Council, Public Health Department, (Special Hospitals), Victoria Embankment, London, E.C.4.

Seamen's Hospital Society.

The Society possesses seven establishments: the *Dreadnought* Hospital at Greenwich, 250 beds; the Albert Dock Hospital, E.16, 53 beds; the Hospital for Tropical Diseases, Endsleigh-gardens, W.C.1, 75 beds; Tilbury Hospital, Tilbury Docks, Essex, 92 beds; Queen Alexandra Memorial Hospital, Marseilles, 60 beds; King George's Sanatorium for Sailors, Bramshott, Hants, 80 beds; and the Angas Home, Cudham, 30 beds. Total, 616 beds. It has also a Dispensary at Southampton, from which patients are transferred to the hospitals. Courses of operative surgery and surgical pathology are arranged by the London School of Clinical Medicine at the Dreadnought Hospital. Post-Graduate Courses for Ship Surgeons are organised by the Society, Part II. (Tropical Medicine and Hygiene) being held at the Hospital for Tropical Diseases, commencing June 15th, and Part III. (Refresher Course in clinical subjects) at the Dreadnought Hospital, Greenwich, commencing July 6th.

The clinical teaching of the London School of Hygiene and Tropical Medicine is given at the Society's Hospital for Tropical Diseases, Endsleigh-gardens, W.C.1.

The Fellowship of Medicine and Post-Graduate Medical Association.

Some 50 general and special London hospitals work in conjunction with this Association, which has its office at Room 28 in the House of the Royal Society of Medicine, 1, Wimpole-street, London, W. 1. Arrangements are made for courses in medicine and in surgery, occupying the whole or part of each day for periods of one to four weeks. Fees, £1 1*s.* to £7 7*s.* Special evening courses for the M.R.C.P. and F.R.C.S. (Final) Examinations are organised at intervals. Series of weekly (free) lectures (during the winter months) and clinical demonstrations in medicine and in surgery (except during August and September) are also arranged. Membership of the Fellowship is open to all qualified medical practitioners, the membership fee being 10*s.* per annum, which includes the subscription to the monthly *Post-Graduate Medical Journal.* The provisional list of Special Courses for 1932 is now available. Full information regarding the courses of study can be obtained from the Secretary.

GENERAL.

Royal Northern Group of Hospitals.

The Royal Northern Hospital, Holloway, London, N.7, is the main institution of the Royal Northern Group of Hospitals, which includes the Royal Chest Hospital, City-road, E.C., Grovelands Hospital (Recovery Branch), Southgate, and the Reckitt Convalescent Home, Clacton-on-Sea. The total number of beds in the group is 455. Besides the honorary staff, there are six anæsthetists, three pathologists, resident medical officer, three resident house physicians, three resident house surgeons, two resident casualty officers, and one resident obstetric surgeon. The large rectangular and circular wards, each of which contains 25 beds, the maternity ward and children's ward for children under 5 years of age, the observation wards in the new Casualty Department, the six operation theatres, and out-patient department are designed with a view of offering the greatest facilities for clinical work. The Special Departments include the following: Fracture, orthopædic, genito-urinary and neurological, physicotherapeutic, pathological (under a director of clinical pathology), tuberculosis, venereal diseases, and X ray (recently remodelled). Patients are removed to the Recovery Branch by ambulance a few days after operation. Demonstrations are given daily in the wards and out-patient departments. Clinical assistants (qualified), clinical clerks, and pathological clerks are appointed in the general and special departments and may receive certificates at the end of their terms of office. A new maternity department has been opened, and the light department has been re-equipped. A complete hospital for paying patients has just been completed.

Weekly lectures by members of the hon. medical and surgical staff are free to all medical practitioners. Special classes and demonstrations are being arranged for post-graduates. They include instruction in general medicine and surgery, and also lectures and demonstrations in special subjects at the Royal Northern and Royal Chest Hospitals.

Prince of Wales's General Hospital.

This hospital, situated in Tottenham, is in the midst of a densely populated neighbourhood, and contains medical, surgical, gynæcological, and children's wards, having 200 beds. There are special departments for gynæcological cases, diseases of the eye, ear, throat, and nose, skin diseases, medical electricity, radiography, and dentistry. Operations are performed every afternoon of the week (except Saturday) at 2.30 P.M. Clinical instruction, ordinarily including laboratory classes, and lectures are given in the wards and out-patient departments, laboratories, and lecture hall in connexion with the North-East London Post-Graduate College attached. There are six resident medical officers, and clinical assistants are appointed under certain conditions. Special intensive post-graduate courses are also held at intervals throughout the year. Further particulars in regard to the hospital may be obtained from Dr. S. C. Shanks, Secretary to the Medical Committee, 87, Harley-street, W.1; or from Mr. T. H. C. Benians, F.R.C.S., Dean of the College, at the Hospital.

West London Hospital.

This hospital has 220 beds. Attached to the hospital is the West London Post-Graduate College. The practice of the hospital is reserved exclusively for qualified men. Instruction is given in the medical and surgical out-patient rooms and demonstrations are given in the wards. Clinical assistantships are obtainable in the various general and special out-patient departments. Special classes are held in the Diseases of the Throat and Nose, Skin, and Eye, and in Gynæcology, Medical Electricity, Operative Surgery, Bacteriology, Anæsthetics, Intestinal Surgery, Medical and Surgical Diseases of Children, Blood and Urine, Clinical Microscopy, Cystoscopy, Venereal Diseases, and Operative Ophthalmology, Radiography, X Ray Therapy. The accommodation for post-graduates consists of a lecture room, together with reading, writing, and class rooms. The hospital has a fully equipped pathological laboratory. The certificate of the hospital is accepted by the Admiralty, War Office, Colonial Office, and India Office in cases of study leave. Further information can be obtained on application to the Dean, Sir Henry Simson, at the Hospital, Hammersmith, W. Secretary of the Post-Graduate College, Mr. C. Cole, and of the Hospital Mr. H. A. Madge.

London Temperance Hospital.

The hospital (Hampstead-road, N.W.) contains 136 beds. The medical and surgical practice of the hospital is open to students and practitioners. Operations: Monday, 1.30 P.M.; Tuesday, 10.30 A.M.; Wednesday, 2 P.M.; Thursday, 8 A.M.; Friday, 11 A.M. Out-patient Departments for special diseases have been opened: Diseases of the Stomach and Disorders of Digestion, Dermatology, Ophthalmology, and Oto-rhino-laryngology.

Hampstead General and North-West London Hospital.

In-patient Department: Haverstock Hill, N.W.; Out-patient Department: Bayham-street, Camden Town (138 beds—viz., 109 free, 8 isolation and observation, &c., and 21 paying or contributory). Serves Hampstead and the populous districts of Kentish Town and Camden Town. The out-patients, with the exception of Hampstead casualty and emergency cases, attend exclusively at the Out-patients' Department, Bayham-street, Camden Town. Further particulars from the Secretary at the hospital. There is a Post-graduate School free to the medical practitioners of the district. The hospital is also associated with the Fellowship of Medicine.

Metropolitan Hospital.

This hospital has 150 beds, 15 of which are reserved for children. The adult accommodation includes special wards for the reception of Hebrew patients. Operations are held in the afternoons daily, except Saturdays and Sundays. The out-patient department is a large one, and has facilities for the treatment of all diseases; special departments comprising: Neurological, Ophthalmic, Rectal Diseases, Diseases of Women, Genito-Urinary, Diseases of the Throat and Ear, Eye and Skin, Electro-Therapeutics, Dental, and V.D. Attached to the hospital is a Tuberculosis Dispensary for patients from the boroughs of Hackney and Stoke Newington. Further particulars may be obtained from the Secretary of the Medical Committee (Mr. C. Naunton Morgan, F.R.C.S.), or from Mr. Herbert F. Rutherford, the House Governor, at the hospital, Kingsland-road, E.8.

Queen Mary's Hospital.

This hospital has developed from the West Ham and Eastern General Hospital. It has 216 beds and ministers to a very poor public. Founded as a dispensary in 1861, and developing into a hospital in 1890, steady extensions have been made during this century. A Royal Charter was obtained in 1917, and the hospital has become a valuable charity with a full medical staff of physicians and surgeons, and specialists for gynæcology, obstetrics, ophthalmological surgery, radiology, and dental surgery. The Fellowship of Medicine and Post-Graduate Medical Association make frequent use of the opportunities here offered. A Radium Officer has recently been appointed as a supply of Radium has been sent to the Hospital by the King's Fund. The hospital has also appointed an Orthopædic Surgeon to set up a new Orthopædic Department, and in addition, a Dermatologist has been appointed to look after the new Skin Department. The number of beds has increased from 213 to 216 by virtue of the fact of the building and opening of a new Isolation Block for the Maternity Wing. Particulars may be obtained from Major Raphael Jackson, Secretary, Queen Mary's Hospital, Stratford, E.15.

NEUROLOGY.

National Hospital, Queen-square.

The hospital, with the Convalescent Home at East Finchley and branch at Clapham Park, contains 265 beds and cots. The out-patient physicians attend every Monday, Tuesday, Wednesday, Thursday, and Friday at 2 P.M., and the physicians daily. Clinical clerks are appointed under physicians and clinical assistants to out-patient physicians. Post-graduate Courses of Lectures and Demonstrations are held three times every year, usually commencing in January, May, and October, and lasting eight weeks. Special Courses in Neurological Ophthalmology, Neuropathology, and the Anatomy and Physiology of the Nervous System are given. The Pathological Laboratory is available for special work under the Pathologist.

West End Hospital for Nervous Diseases.

This institution is recognised by the University of London and by the Conjoint Board as a school of instruction in Neurology for the M.D. degree, Branch III., and for the D.P.M. The Out-patient Department is in Welbeck-street, W.; the In-patient Department is at Gloucester-gate, Regent's Park, and contains 78 beds. Completely equipped with pathological and other special departments, the hospital offers every facility for instruction in Neurological subjects. In conjunction with Bethlem Royal Hospital it offers courses of instruction for the D.P.M. The hospital coöperates with the Fellowship of Medicine in the programmes of special post-graduate teaching organised by the Association. Appointments as Hon. Clinical Assistants in the Out-patient Department are open to registered medical practitioners. Senior and Junior Resident House Physicians are appointed for a period of six months in the first place with remuneration at the rate of £150 and £100 per annum, respectively. The Savill Memorial Prize (value £15) and Medal are offered biennially for competition among post-graduate students who have attended the practice of the hospital or any special course. Full particulars may be obtained from Dr. C. Worster-Drought, Dean, or J. P. Wetenhall, Secretary, 73, Welbeck-street, W.

Hospital for Epilepsy and Paralysis.

This hospital in Maida Vale, W., contains 88 beds, including 20 private wards and 6 pay beds. Both in-patient and out-patient departments are open free to students, as well as to medical graduates. The out-patient department is open every week-day except Saturday at 2 P.M.

HEART AND LUNGS.

Royal Chest Hospital.

The Royal Chest Hospital, City-road, E.C. (associated with the Royal Northern Group of Hospitals, see p. 460), is the oldest chest hospital in London. It has accommodation for 84 in-patients and a large out-patient department, where out-patients are seen daily at 2 P.M., except Saturdays. Special departments include Thoracic Surgery, Laryngology, Radiology, Electrocardiograph, Massage and Physical Exercises, and an Ultra-Violet Light clinic. Clinical Assistants are appointed to work with the physicians in the out-patient department. The Tuberculosis Dispensary for Islington South is attached to the hospital.

Brompton Hospital for Consumption and Diseases of the Chest.

The hospital contains 350 beds. The recent provision of 25 (surgical) beds in a special block has increased the total number up to 350 (approximately). The sanatorium at Frimley contains 100 beds and 50 beds for paying patients. Six house physicians reside in the hospital for a term of six months; their duties include attendance in the out-patient department. An additional month may be spent at the Sanatorium. Pupils are admitted to the practice of the hospital. Clinical Demonstrations are given throughout the year by members of the medical staff. Clinical assistants are appointed to the physicians in the out-patient department and clinical clerks to the physicians in the wards. The medical practice of the hospital is recognised by the English Conjoint Board and also by the University of London, the Apothecaries' Society, and the Army and Navy and Indian Medical Boards. The hospital is open to post-graduates and students. Two special post-graduate courses are held during the year. For undergraduates, four courses of eight demonstrations are held throughout the year before each final Conjoint Board examination. For further particulars application should be made to the Dean, Dr. W. J. Fenton.

Mount Vernon Hospital.

The hospital contains 150 beds, Surgical. Clinical Demonstrations are given by the visiting Medical Staff at the hospital at Northwood. Clinical assistants are appointed to physicians in the wards. Diagnostic and follow-up departments, 14, Riding House-street, W.1.

City of London Hospital for Diseases of the Heart and Lungs.

Special Departments: Surgical, Laryngological, Radiological, Pathological, Electrocardiographic. Assistants are appointed to the Clinics, and a limited number of research workers to the Pathological Department. The in-patients staff visit generally in the afternoon; out-patients at 2 P.M. Graduates are admitted on payment of fees which entitle them to attendance at clinics, post-mortem demonstrations, and operations. Special demonstration and lecture courses are provided, and a club room. Graduates desiring Assistantships in any department should address applications to the Head of that department. A Tuberculosis Dispensary (Boroughs of Bethnal Green and part Hackney) is established at the Hospital, Victoria Park, E.2.

National Hospital for Diseases of the Heart.

The practice of the hospital (founded 1857), both in the wards and out-patient department, is open daily to post-graduates and others. Systematic courses of instruction, with lectures and clinical demonstrations, are arranged during the winter and summer sessions; in addition an intensive course, of a fortnight's duration, takes place in January, July, and October of each year. The hospital is fully equipped with all the modern instruments for the investigation of the diseases of the cardiovascular system, and facilities exist for those requiring practical instruction in electrocardiography, X rays, and other graphic methods. Clinical Assistants in the out-patient department are appointed from time to time. The hospital is situated in Westmoreland-street, London, W.

DISEASES OF WOMEN AND CHILDREN.

Hospital for Sick Children.

This hospital in Great Ormond-street, W.C., contains 252 beds. The practice is open to students of both sexes who have completed four years of medical study and also to qualified medical men and women. The medical staff are recognised by the University of London as teachers in Diseases of Children. Arrangements have also been made with University College Hospital and the London School of Medicine for Women for the routine admission of their students of both sexes to clerkships and dresserships in the wards. Appointments are made every three months to eight medical clerkships, which are open to students of the hospital. Clinical instruction is given daily by members of the visiting staff. Clinical Clerks are appointed once a month. In the pathological department facilities are afforded to post-graduates for obtaining theoretical and practical instruction in Clinical Pathology and Bacteriology, and in Medical Biochemistry in the Pathological and Biochemical Laboratories. Courses of eight to ten Lecture-Demonstrations are given at weekly intervals twice a year in both subjects (Clinical Pathology and Bacteriology, and Biochemistry.). Time spent in clerking and dressing is recognised by the Universities of London, Oxford, and Cambridge, as well as by the English Conjoint Board as part of the final curriculum. These appointments are open to students of all recognised medical schools. In addition, special courses are held from time to time (generally in May and October), as well as routine post-graduate instruction daily.

Queen Charlotte's Maternity Hospital and Midwifery Training School.

This hospital, formerly Queen Charlotte's Lying-in Hospital, is situated in Marylebone-road, N.W. The hospital receives over 2500 patients annually, besides having a large out-patient department. Medical pupils are received at all times of the year. Pupils have unusual opportunities of seeing obstetric complications and operative midwifery on account of the very large number of primiparous cases—nearly one-half of the total admissions. Clinical instruction is given on the more important cases which present themselves. They also receive valuable instruction in the Antenatal Department, where over 4000 patients attend yearly. Special Lecture-demonstrations are given by members of the staff. Certificates of attendance at this hospital are recognised by all the Universities, Colleges, and licensing bodies. Pupil midwives and maternity nurses are received and specially trained. A Residential College provides accommodation for students and qualified practitioners (both men and women), and is opposite the hospital, with which it is in telephonic communication.

Arrangements have been made for Medical Students to receive the preliminary instruction in Practical Midwifery recommended by the General Medical Council.

The Isolation Block (30 beds) for Puerperal Fever and Puerperal Pyrexia, which has been built on the new site at Ravenscourt Park, Hammersmith, was opened for the reception of patients in September, 1930, and the Research Laboratories, which have been erected adjoining this block, are now in full working order.

Students may attend the clinics conducted by the staff at the Isolation Block.

Royal Waterloo Hospital for Children and Women

This hospital, founded at the date indicated by its title, has within recent years undergone considerable extensions and has now 130 beds, while the latest buildings include a Nurses' Home, a new Operating Theatre, and private pay beds. It has a full staff of surgeons, physicians, and gynæcologists, and also special departments. Amongst the many new additions to the equipment of the hospital is an Electrocardiograph apparatus. A new Orthopædic Department is in use, and the Physiotherapeutic and Electrical Department has been extended and re-equipped. There are facilities for post-graduates to attend the general and special clinics in medicine and surgery for in-patients, and for out-patients, including a genito-urinary clinic, a clinic for varicose veins, a L.C.C. Clinic for children suffering from rheumatic fever and chorea, and the X ray department for gastro-intestinal diagnosis. Particlars of post-graduate courses, which are held from time to time, can be obtained from the Secretary of the Hospital, Waterloo-road S.E., or from the Fellowship of Medicine.

Victoria Hospital for Children.

This hospital in Tite-street, Chelsea, S.W., contains 138 beds and a large out-patient department; the home at Broadstairs has 50 beds. Private wards in the Nurses' Home, named after H.R.H. Princess Mary (Viscountess of Harewood), at 29, Tite-street, adjacent to the hospital. Patients may be under the care of any medical practitioner holding an appointment on the staff of a recognised hospital, and the question of payment for his fees is arranged between him and the child's parents. Application for admission should be made to the Secretary.

Queen's Hospital for Children.

This hospital, for the sick children of the poor under 14 years of age, was formerly known as the North-Eastern Hospital for Children. There are 160 beds in London (Hackney-road, E.2) and 44 at the seaside branch, "Little Folks" Home, Bexhill. Special departments in Ear, Nose, Throat, Skin, and Eye, and Dentistry. Rheumatic Clinic in coöperation with L.C.C. schools weekly. A radiologist attends four times weekly. There are massage and light departments, and a special whooping-cough physician. The practice of the hospital is open to students by arrangement with the medical staff, and post-graduate instruction in children's diseases, lectures and demonstrations are given at times notified by the Fellowship of Medicine.

Paddington Green Children's Hospital.

This is a small hospital (42 beds) with a large out-patient department and a full staff, with Eye, Ear, Skin, Light, and Dental departments. The facilities which it offers for observation of clinical practice are used by the Fellowship of Medicine.

Hospital for Women.

This hospital in Soho-square, W., contains 82 beds. The teaching is available for post-graduates only in limited numbers. Operations take place on Tuesdays, Wednesdays, and Thursdays at 2 P.M. and on Mondays and Fridays at 9.30 A.M. The X ray department is supplied with the latest installation both for diagnosis and treatment, and experience can also be gained in the treatment of malignant disease by means of radium. Incorporated is the London School of Gynæcology, comprising attendance in out-patient department, operating theatre, clinical lectures, and X ray treatment.

Samaritan Free Hospital for Women.

Contains 70 beds. Qualified practitioners are admitted as clinical (gynæcological) assistants to both the in- and out-patient departments. Full particulars may be obtained from the Secretary to the Medical Committee at the hospital, Marylebone-road, N.W.

East London Hospital for Children and Dispensary for Women.

There are 140 beds. Clinical instruction in Pediatrics is given to fifth-year Students at the hospital in Glamis-road, Shadwell, E. Two clinical clerkships for qualified or unqualified students are open every three months. Clinical assistants are from time to time appointed in the out-patient department. There is an Orthopædic Clinic on Wednesdays, and a

Rheumatism Clinic on Thursdays. Special instruction in Infant Feeding. Post-graduate Clinical Demonstration on the third Wednesday in each month.

Chelsea Hospital for Women.

This hospital, situated in Arthur-street, Chelsea, S.W., has 100 beds, and a certain number are reserved for patients paying £5 5*s.* a week and small fees to the surgeons for operations. There is a convalescent home of 32 beds at St. Leonards. At a large out-patient department the patients are seen at a nominal payment. The hospital caters for post-graduate teaching. In the out-patients' department clinical assistantships can be obtained which entitle the holder to attend out-patients and examine patients under the instruction of the visiting surgeons. The operating theatre is open to visitors, and all operations are demonstrated and discussed by the surgeons. Special intensive course, with lectures, special demonstrations, are held three times a year through the organisation of the Fellowship of Medicine.

Evelina Hospital and Belgrave Hospital.

The Evelina Hospital, Southwark (80 cots), and the Belgrave Hospital (76 cots), Clapham-road, also give facilities for out-patient practice.

OPHTHALMOLOGY.

Royal London Ophthalmic Hospital.

The attendance at Moorfields Eye Hospital (Moorfields, 1804–1899), City-road, E.C. (152 beds), is now very large. Operations are performed daily from 10 A.M. to 1 P.M., and four surgeons attend on each day. Students are admitted to the practice of the hospital, and special courses of instruction are given, which extend over a period of five months, by members of the Surgical Staff, beginning in October and March. The instruction and classes are arranged so as to meet the requirements for the various diplomas in Ophthalmology, both the preliminary examinations in Anatomy, Physiology and Optics, and those subjects required in the second part. Students of the hospital are eligible as house surgeons or clinical and junior assistants; these are appointed every three months.

Royal Westminster Ophthalmic Hospital.

This hospital, in Broad-street, Holborn, W.C. (85 beds, including 14 rooms for paying patients), has recently removed from its original site at Charing Cross to much larger premises, well adapted for teaching purposes. The clinics are held in the afternoons from 1 P.M. Operations are performed daily in the theatre at 3 P.M. Lectures and practical classes in the various branches of Ophthalmology, including Operative Surgery, Bacteriology, and Pathology, are held during the winter and summer sessions at 5 P.M. The practice of the hospital is open to both men and women practitioners, and medical students. Post-graduate students at the hospital are eligible for appointment as house surgeon, assistant house surgeon, refraction assistant (seven appointments paid), and senior and junior assistants.

Royal Eye Hospital.

There are 44 beds and 2 cots at the hospital in St. George's-circus, Southwark, S.E. Clinical instruction is given to students and post-graduates daily at 2.30 P.M., and Lectures, Demonstrations, and Laboratory Classes are arranged in preparations for examinations in Ophthalmology. Apparatus has been installed for the Microscopy of the Living Eye. Post-graduate students are eligible for appointment as Clinical Assistants and as Refraction Officers. A new Clinic for paying patients under the Voluntary Hospitals Ophthalmic Clinic Scheme came into operation on July 1st.

Central London Ophthalmic Hospital.

This hospital, in Judd-street, St. Pancras, W.C., has 48 beds, and clinical teaching is given daily. Classes of instruction in the use of the ophthalmoscope, with demonstrations on cases, and also classes on other subjects, to meet the requirements of the Conjoint Board for the D.O.M.S., and of the University of London for the M.S. in Ophthalmology, are given during the winter months, commencing in October. This school is recognised as a teaching institution by the Universities of London and Oxford, as well as the English Conjoint Board. It receives a portion of the pupils of the University College Hospital for the purposes of ophthalmic training. The Pathological and Bacteriological Laboratories have been rendered available for the use of any ophthalmic surgeons who desire to send specimens for examination. A small fee is charged for a report. A clinical Demonstration is held by members of the staff at the Central London Ophthalmic Hospital at 5 P.M. on the first Tuesday of every month. Doctors and students of medicine are admitted free.

GENITO-URINARY AND VENEREAL DISEASES.

London Lock Hospital and Home.

In the institution at Harrow-road, W., founded 1746, there are 201 beds. In the male department and out-patient department in Dean-street, Soho, W., there are 37 beds. Male and female patients are seen at 91, Dean-street, Oxford-street, W.1, at any time from 9 A.M. until 9 P.M. daily, including Sundays. Intravenous injections are given at every clinic. Irrigations for males are given daily from 8 A.M. to 9 P.M. Female patients and children are seen daily at 283, Harrow-road, Paddington, W.9, from 9 A.M. until 8 P.M. Irrigations for females are given at any time. The hospital is linked up with the Fellowship of Medicine; special courses of lectures are held in May and November each year, and application for tickets should be made direct to the Secretary of the Fellowship. Only a limited number of practitioners and students are permitted to attend the practice of the Female Lock Hospital, and application should be made to the Dean at the Male Lock Hospital, between the hours of 11 A.M. and 5 P.M., or to the Secretary at the Head office, 283, Harrow-road, W. 9. Telephone No. 2272–3 Abercorn.

St. Mark's Hospital for Cancer, Fistula, and other Diseases of the Rectum.

At St. Mark's Hospital for Cancer, Fistula, and other Diseases of the Rectum, City-road, E.C. (founded 1835), for men and women, there are 62 general beds and 9 private beds. Operations are performed on Mondays, Tuesdays, Wednesdays, Thursdays, and Saturdays, 2.30 P.M. Medical practitioners and students are invited to the operations and to the clinical instruction in the wards and in the out-patient department. Two weekly courses are held during the year in coöperation with the Fellowship of Medicine.

St. Peter's Hospital.

It is anticipated that a scheme for completely remodelling St. Peter's Hospital for Stone, &c., now in progress, will be completed by the end of 1931. There will then be avilable 33 male and 6 female beds. The new Department of Pathology with Museum (10, Henrietta-street, W.C.2) is open and in full work, and a completely up-to-date X ray department (diagnostic work only) is nearing completion. The alterations to the operating theatre and wards are well in hand, but during this period only an average of 20 beds are available for patients. Research is still carried out with Radium specially loaned for the purpose by the British Empire Cancer Campaign. Medical practitioners and students are invited to the clinical instructions, which are given in the out-patient department daily, excepting that the only out-patient clinic open to medical women is that held at 2 P.M. Fridays for women and children, and to the operations in the theatre on Mondays at 2.30 P.M., and Wednesdays and Fridays at 2 P.M. Post-graduate Courses of Lectures are given from time to time, dates being advertised in the medical journals.

All Saints' Hospital.

The in-patient department (31 beds) of the All Saints' Hospital for Genito-Urinary Diseases is at Finchley-road, and the terms of admission are free or by payment according to means. The out-patient department in the Vauxhall Bridge-road provides clinical instruction through the Fellowship of Medicine, in addition to which demonstrations in cystoscopy and other branches of genito-urinary work are available for all medical practitioners at the Out-patient department on Tuesday, Wednesday, Thursday, and Saturday afternoons, at 1.45 P.M., without fee

ORTHOPÆDICS.

Royal National Orthopædic Hospital.

This institution, situated in Great Portland-street, W. (480 beds), is a good example of the fusion of small and scattered activities for the creation of an effective whole. The three orthopædic hospitals of the metropolis were combined for the formation of this central institution at the instance of the King's Hospital Fund, with the result that the grants from this Fund and the income from subscriptions can now be used to far better purpose and with economy. The hospital has also been approved by the Ministry of Health for the treatment of tuberculosis, the connexion between orthopædics and the therapeutics required in many forms of tuberculosis having become obvious. Country branch at Brockley Hill, Stanmore (280 beds). Both branches of the hospital are residential schools for physically defective children, certified by the Board of Education. Post-graduate courses of 14 days each are held twice yearly.

EAR, NOSE, AND THROAT.

Central London Throat, Nose and Ear Hospital.

This hospital in Gray's Inn-road, W.C., is open daily to all qualified medical practitioners on presentation of their visiting cards. Demonstrations of the cases and clinical instruction are given daily by the chief surgeon of each clinic. Lectures each Friday at 4 P.M. An intensive Course of Lectures (especially suitable to D.L.O. students), with Anatomy and Physiology Class, Operative Surgery Class, Peroral Endoscopy Class, and Pathology Class is given twice yearly—in May and October. Preparatory courses in methods of Examination and Diagnosis at frequent intervals. Consultations on interesting cases take place on the fourth Wednesday in each month at 4 P.M. Clinical Assistants are appointed and are expected to hold office for at least three months. They are required to attend twice weekly at 1.30 o'clock for the afternoon, and at 4.30 o'clock for the evening clinics. New wing, with complete out-patient department and additional wards, was opened in August, 1929.

Golden-square Throat, Nose and Ear Hospital.

The hospital has absorbed the London Throat Hospital, formerly of Great Portland-street. The hospital is situated in Golden-square, near Piccadilly-circus. Clinical instruction in the diagnosis and treatment of disease is given daily in the out-patient department from 2 to 5 P.M., and on Tuesdays and Fridays from 6.30 to 9 P.M. There is an annual out-patient attendance of over 65,000. Minor operations are performed on Mondays, Wednesdays, and Fridays at 9.30 A.M. The hospital now contains 101 beds, of which 25 are for private patients. Practitioners and medical students are admitted to the practice of the hospital, and clinical assistants are appointed periodically.

Metropolitan Ear, Nose, and Throat Hospital.

The hospital (founded 1838) is in Fitzroy-square, W. The Out-patient Department is opened daily at 2.30 P.M., Saturdays 1.30 P.M., to all medical practitioners and senior students for acquiring clinical instruction and technical knowledge. Operations upon in-patients are performed on Tuesdays, Wednesdays, Thursdays, and Fridays at 10 A.M. Clinical Assistants are appointed as vacancies occur.

SKIN.

London School of Dermatology.

The London School of Dermatology, St. John's Hospital for Diseases of the Skin, 49, Leicester-square, W.C., has an in-patient Department (33 beds) at 262 Uxbridge-road, W., and out-patient Clinics are held daily at 2 and 6 P.M. (Saturdays 2 P.M. only), when demonstrations are given on the cases presenting themselves. The Chesterfield Lectures, constituting a systematic course in dermatology, are given on Tuesdays and Thursdays at 5 P.M., from October to March, by the hon. medical staff of St. John's Hospital and the physicians in charge of the Dermatological Departments of the London Teaching Hospitals. The lectures are free to those attending the practice of the hospital and to registered medical students. At the end of the course an examination is held for the Chesterfield Medal in Dermatology, and is open to all medical practitioners, the examination fee being £2 2*s*. The electrical department is open daily from 2 to 4 P.M., except on Wednesdays and Saturdays. Laboratory Courses in the Pathology and Bacteriology of the Skin can be arranged.

London Skin Hospital and Hospital for Diseases of the Skin.

The London Skin Hospital (Fitzroy-square) and the Hospital for Diseases of the Skin (Blackfriars-road) admit graduates to their practice, which is among out-patients. London Skin Hospital, daily at 2 P.M. and 5.30 P.M.; Hospital for Diseases of the Skin, daily at 2 p.m., and Fridays, 5.30 P.M.

CENTRES OUTSIDE LONDON AFFORDING EDUCATIONAL FACILITIES.

Nearly every hospital of a general character in the country having more than 150 beds falls within this category, and certain of them have already been noticed in connexion with the universities to which their clinical practice is attached. The hospitals vary much in size and scope.

The following alphabetical list includes the provincial hospitals which are recognised by the English Conjoint Board for a part of the required training in medical and surgical practice through clerkships and dresserships.

Bath Royal United Hospital.

This hospital contains 212 beds, 72 of which are situated in Combe Park, Bath, and are for paying patients only, and possesses X ray, Massage, Bacteriological Departments, a Pathological Laboratory, and a fine library. Secretary-Superintendent: Mr. J. Lawrence Mears. V.D. Clinics are held on Tuesdays (for women), and on Fridays and Saturdays (for men), at 5 P.M., and Ear, Throat, and Nose Clinics on Wednesdays, at 1.45 P.M.

Bedford County Hospital.

This hospital at Bedford has 124 beds, including 15 beds in the paying and 13 beds in the maternity wards; Ear, Nose and Throat Departments, and X ray and Pathological Departments. There is in connexion with the institution a convalescent home (20 beds) at Aspley Heath, near Woburn Sands. The hospital is approved by the University of London for the M.D. and M.S. Examinations. Secretary: Mr. B. Wadmore.

Bradford Royal Infirmary.

This hospital at Bradford contains 215 beds and, in addition, has 50 recovery beds at the Woodlands Convalescent Home, Rawdon. The acting staff consists of 4 Honorary Physicians, 4 Honorary Surgeons, 1 Honorary Radiologist, 1 Honorary Laryngologist, 1 Honorary Ophthalmic Surgeon, 1 Honorary Dental Surgeon, 1 Honorary Assistant Dental Surgeon, 2 Honorary Assistant Physicians, 2 Honorary Assistant Surgeons, 6 Anæsthetists, 1 Pathologist, 1 Physician-in-charge of Radium Therapy Department, 1 Resident Surgical Officer, 1 House Physician, and 4 House Surgeons. There are special clinics for Orthopædic cases, for Electrotherapeutic and Sunlight Treatment, and for Radium Therapy. A new hospital of 360 beds is in construction, and a self-contained block for 70 paying patients has been opened adjoining the new Infirmary. Secretary-Superintendent: Mr. J. J. Barron.

Coventry and Warwickshire Hospital.

There are 307 beds available at the Main Hospital at Coventry (established 1840), and 40 beds at the Alcock Convalescent Hospital, Keresley (three and a half miles distance), which is used as an annexe. At the Main Hospital there are separate Medical, Surgical, Maternity, Children's and Accident Wards, also separate Ophthalmic Block complete with its own Theatre. There are separate departments for Clinics for Ear, Nose and Throat Diseases, X Ray, Electrical, and Sunlight Clinics, also V.D. Clinic. There is also an up-to-date Pathological Laboratory.

Derbyshire Royal Infirmary.

This general hospital at Derby (347 beds) was rebuilt in 1892–94. In recent years there have been numerous alterations and additions to keep pace with modern requirements. The hospital is built on the pavilion system and provides, in addition to the usual Medical and Surgical blocks, a separate Ophthalmic block of 40 beds, a separate Children's block of 34 beds (Medical and Surgical). Gynæcological Wards, and an Ear, Throat, and Nose Department. There is a large and well-equipped Out-patient Department, also separate Orthopædic, X Ray, Electrical, Pathological, and Venereal Diseases Departments. The salaried Medical Staff consists of a non-resident Staff of 1 Surgeon-in-charge of X Ray and Electrical Departments, 1 Surgeon-in-charge of Venereal Diseases Department, 4 Anæsthetists. and a Resident Staff of 4 House Surgeons, 1 House Physician, and 1 Assistant House Surgeon and Casualty Officer. Registered Medical Students are admitted to witness the medical and surgical practice on payment of fees. Superintendent and Secretary: Mr. Walter Banks, F.C.I.S.

Gloucestershire Royal Infirmary and Eye Institution.

This hospital at Gloucester has 155 beds. Secretary: F. J. Symons. An Electrical and Massage department has been established and Venereal Clinic opened. Also Ear, Nose, and Throat department, X Ray department, Ultra-violet Ray department, Orthopædic department, Dental department, and Pathological Laboratory.

Hull Royal Infirmary.

This hospital at Hull contains 270 beds, plus 100 beds at the branch hospital at Sutton-on-Hull, opened in February last. Since the establishment of the Parent Institution in 1782 it has undergone steady additions and improvements, including up-to-date Ophthalmic, Radiological, Nose, Throat and Ear, Dental, V.D., Violet Rays, and Pathological Departments. A Clinic for Functional Nervous Diseases has recently been opened in conjunction with the Hull Corporation, under the Mental Treatment Act, 1930. Recent extensions include a new Operating Theatre, Nurses' Home, and extensions to the old X Ray, Electrical, and Out-patient Departments. The Resident Staff consists of 1 House Physician, 1 House Surgeon, 1 Assistant House Physician, 2 Assistant House Surgeons, 1 Assistant Surgeon to Special Departments, 1 Casualty Officer. Sutton Branch: 1 House Surgeon and 1 House Physician. An annexe at Withernsea has accommodation for 30 patients. The senior house physician's appointment is recognised by the University of London for the M.D., Branch I. (General Medicine) examination. It also recognises the posts of senior house surgeon and second house surgeon for the M.S., Branch I. (General Surgery) examination. The post of house surgeon to the Special Departments is recognised by the Conjoint Board of the Royal Colleges for the examinations for the Diplomas in Ophthalmic Medicine and Surgery, and Laryngology and Otology. The hospital is also recognised by the Royal Colleges for the F.R.C.S. examinations.

Kent and Canterbury General Hospital.

The hospital at Canterbury contains 120 beds. Pupils of the staff are admitted to the practice of the hospital. Operations daily. Special departments include Ophthalmic, Ear, Nose and Throat, Venereal, Orthopædic, Electrical, Actinotherapeutic, X Ray, and Bacteriological. The hospital is recognised by the University of London for the purpose of the M.D. and M.S. examinations. Superintendent and Secretary: Mr. W. T. Southwood.

Leicester Royal Infirmary.

At the General Infirmary, Leicester, there are 392 beds (children's 66, and venereal diseases 15). In addition 63 beds have been retained at local convalescent homes for the reception of early recovery cases, and £330,000 spent on bringing the accommodation of the institution to a modern standard of efficiency. This scheme has included the provision of four modern operating theatres, three new wings, and self-contained out-patients' department. The Children's Hospital has been reconstructed and enlarged by the addition of a third ward at a cost of £14,500. Pathological laboratories and post-mortem rooms were erected at a cost of £11,000, also an orthopædic out-patient department at a cost of £9500, £5000 of which was provided by the Freemasons of the province as their war memorial. The Nurses' Home has recently undergone enlargement by 60 bedrooms, and now provides for 150 nurses and staff. A large house has been purchased to accommodate the night nurses, but it is hoped to provide additional accommodation to enable all the nurses to be accommodated in one home. For this purpose the nurses' home is to be enlarged at a cost of £50,000. Other recent structural improvements comprise reconstruction of the kitchens, new temporary ward of 30 beds, and a new venereal disease department. There are twelve resident salaried medical officers—viz., four house surgeons, one casualty officer, two house physicians, three anæsthetists, and two dressers. Most of the posts are filled half-yearly, April and October, and afford exceptional opportunities for post-graduate experience and senior students. Dressers are given an honorarium. Students who seek resident dresserships should apply to the House Governor and Secretary. A post-graduate course of lectures is arranged annually by the Leicester Medical Association, and also clinical classes are held for graduates preparing for M.D. and M.R.C.P.

Norfolk and Norwich Hospital.

This hospital at Norwich has at present 392 beds. There is a convalescent home with accommodation for 35 patients at Cromer. The Resident Medical Staff consists of one House Physician, three House Surgeons, one House Surgeon to the Ear, Nose, Throat, and Eye Department, and one Casualty Officer. There is also a Private Patients' Home which has at present 20 beds. Students are admitted to the practice of the hospital for a fee of £5 5s. for six months. House Governor and Secretary: Mr. Frank Inch.

Northampton General Hospital.

Two new wings of this hospital at Northampton were opened in 1901, and the old buildings entirely renovated and rearranged. In 1926 a new isolation block of 30 beds was opened. The number of beds is 246. There is an up-to-date Pathological Laboratory, also X Ray and Therapeutic Department and V.D. Clinic. Two new operating theatres have been built, and a new ophthalmic in-patient department has recently been completed.

North Staffordshire Royal Infirmary.

The New Infirmary, opened in 1869, at Hartshill, Stoke-on-Trent, is built on the pavilion plan, has accommodation for about 346 patients, including Children's wards, a Bacteriological and Pathological department, and a department for the treatment of Diseases of the Eye, X Ray and Electrical department (including Ultra-Violet Ray Lamps); Cardiographic department, a department for the treatment of Diseases of the Ear, Nose, and Throat, an Orthopædic department, an Electrocardiograph department, Dental department, and Venereal Diseases clinics, including daily Intermediate Treatments. Recent extensions comprise a new ward block, new X Ray and Orthopædic departments with connecting corridors to the existing infirmary, large extensions to the nurses' home, a new boiler house, new chimney stack, and a new laundry. Secretary and House Governor: Mr. W. Stevenson.

Nottingham General Hospital.

There are at this hospital 377 beds available for medical and surgical patients, and 54 beds are in the detached branch, known as "The Cedars" Branch of the General Hospital. The Resident Medical Staff consists of 2 House Physicians, 4 House Surgeons, 1 Aural House Surgeon, and 2 Casualty Officers. The special departments are the Ear, Nose and Throat, Skin, Dental, Massage, X Ray, Orthopædic, Electro-therapeutic, Ultra-Violet Light. House Governor and Secretary: Mr. P. M. MacColl.

Royal Berkshire Hospital.

This hospital at Reading, which contains 268 beds, includes an Out-patient Department, a Casualty Department, an X Ray and Radiotherapeutic Department, Electrotherapeutic and Massage Department, an Orthopædic Department, a V.D. Clinic, a Laboratory, an Eye Theatre, Eye Wards, a Maternity Ward, a Paying Patients Unit, and a Private Nursing Staff, and two motor ambulances. The hospital is approved as a Training School for Nurses and by the Ministry of Health for V.D. Treatment. The Blagrave Branch, Calcot, opened in 1930, contains 63 beds for cases of disease of bones and joints and those requiring open-air treatment.

Royal Devon and Exeter Hospital.

The hospital at Exeter contains 225 beds (including special children's wards) and has a good library, museum-post-mortem room, and pathological laboratory. Attendance on the practice of this hospital qualifies for all the examining boards. There is also a Private Nursing Staff attached to the hospital. For particulars as to fees, &c., apply to the Matron. A new wing was added in 1897 and the "Victory" wing for the treatment of discharged disabled soldiers and sailors completed and opened in 1922. Doctors in practice may use the museum and library. The Electrical Treatment Department, opened in 1907, was enlarged in 1925, and now forms one of the most important sections of the hospital. At the department for the treatment of genito-urinary diseases there are three sessions per week, two for men at 3 P.M. and 7 P.M., and one for women at 3 P.M.

Royal Hants County Hospital.

The hospital at Winchester contains 168 civilian beds. Secretary: Mr. Herbert Maslen.

Royal Hospital, Portsmouth.

The hospital contains 195 beds. There are Pathological, X Ray, Massage, and Medical and Surgical Out-patient departments.

Royal Hospital, Wolverhampton.

There are 240 beds. Special Departments for Children, Infectious Cases, Gynæcology, Maternity, Ear, Throat, and Nose Diseases, Electrotherapeutic and X Rays, Orthopædics, Artificial Sunlight, Venereal Disease, Pathological and Biochemical Laboratories, Dentistry, Radium, and Electrocardiograph. There is an excellent medical library. The Resident Staff consists of Resident Assistant Surgeon and Surgical Registrar, one House Physician and five House Surgeons. Women's Department, one Resident Medical Officer, and one House Surgeon. Pupils are allowed to witness the whole of the practice of the hospital, and to be present at operations, and have every opportunity of acquiring a practical knowledge of their profession. The hospital is recognised by the various Examining Bodies for a part of the requisite attendance on Medical and Surgical Practice. A course of Practical Pharmacy is given by the Pharmacist. Fees on application. Applications should be made to the Honorary Secretary of the Medical Committee.

Royal Salop Infirmary.

This hospital at Shrewsbury has 150 beds. In-patients, 1992; out-patients, 1402; out-patients' attendances, 32,638; accidents and casualties, 6225; dental cases, 519. Secretary-Superintendent: J. W. Noble. The New Wing for the reception of Women and Children is capable of accommodating some 40 patients.

Royal South Hants and Southampton Hospital.

This hospital at Southampton contains 250 beds with every facility for clinical instruction. Special Departments: Ear, Nose, and Throat, Ophthalmic, Dermatological, Electro-Cardiograph, X Ray, Massage and Electricity, Ultra-Violet Ray, Venereal Diseases. Large Out-patient Department.

Royal Sussex County Hospital.

This hospital at Brighton has 246 beds and affords ample facilities for students, possessing a large out-patient department, including Ophthalmic, Dental, Dermatological, Ear, Nose and Throat, X Ray, and Electrotherapeutic sections, and a well-appointed clinical research and bacteriological department. The hospital does not take resident pupils, but out-pupils may attend the practice of the hospital for any period not exceeding two years, on payment in advance of a fee, not exceeding 20 guineas, as the Board of Management shall direct.

Salisbury General Infirmary.

This hospital at Salisbury contains 161 beds. Maternity and antenatal ophthalmic wards; and Ear, Nose and Throat Wards; maternity and child welfare clinic.

South Devon and East Cornwall Hospital.

This hospital at Plymouth has 240 beds (including 10 for venereal diseases in a separate building). Special departments include Pathological, X Ray, Deep Therapy, Cardiographic, Ultra-Violet Rays, Electrotherapeutic, Orthopædic, Gynæcological and Aural; also medical and surgical out-patients. Pensioners are received as in-patients, and are also treated as out-patients.

Staffordshire General Infirmary.

This hospital was established at Stafford in 1766, and has over 100 beds. It is a Training School for Nurses. Paying Patients are accepted. Mr. A. E. Collins, Secretary.

West of England Eye Infirmary.

Students of the Exeter hospital can attend the practice of the Eye Infirmary (64 beds). A ward is set aside for newly-born babies suffering from infectious eye diseases. Mothers with babies are accommodated.

Worcester General Infirmary.

This hospital at Worcester has 132 beds. Pupils are taken by members of the Honorary Medical and Surgical Staff. New X Ray and Electrical and Wolfram Arc Light, Ear, Nose and Throat, and Orthopædic Departments have been erected and are now in use. Additional accommodation for the Honorary Staff and Out-patients and also an Outdoor Shelter in connexion with the Children's Ward have been built as a memorial to King Edward VII., and fire-escape staircases erected. Plans have been prepared for an increase in bed accommodation to 200 beds; also Pathological Laboratory and two new Operating Theatres. A Gynæcological Department has recently been instituted, and a new nurses' home is being built. There is a Department for Venereal Diseases and Surgical Tuberculosis cases are treated. There is also a Mental Outpatient Clinic.

York County Hospital.

This hospital at York contains 190 beds. There are balconies for outdoor treatment, X Ray department, electrotherapeutic and massage department, actinotherapy installation, clinical laboratory, and a Zünd-Burguet apparatus for treatment of chronic deafness. There are clinics for Functional Nervous Disorders, Venereal Diseases, and Electrocardiography.

MEDICAL EXAMINING BODIES AND SCHOOLS IN SCOTLAND.

UNIVERSITY OF EDINBURGH.

Four Degrees in Medicine and Surgery are conferred by the University of Edinburgh—viz., *M.B.*, *Ch.B.*, *M.D.*, and *Ch.M.* The degree of *Ch.B.* shall not be conferred on any person who does not at the same time obtain the degree of *M.B.*, and the degree of *M.B.* shall not be conferred on any person who does not at the same time obtain the degree of *Ch.B.* No one is admitted to the degrees who has not been engaged in study for five years.

Candidates for the degrees of M.B. and Ch.B. must have attended for at least three academic years the medical and surgical practice either of the Royal Infirmary, Edinburgh, or of a general hospital elsewhere which accommodates not fewer than 80 patients and possesses a distinct staff of physicians and surgeons. They must have attended courses of instruction in Clinical Surgery and Clinical Medicine each of nine months, and courses of instruction in all the subsidiary subjects. They must have attended a course in Clinical and Practical Midwifery and have personally conducted 12 cases.

With respect to the places and institutions at which the studies of the candidates may be prosecuted the following regulations have effect:—Three of the five years of medical study must be spent in the University of Edinburgh. The remaining two years may be spent in any University of the United Kingdom, or in any Indian, Colonial or Foreign University or medical school recognised for the purpose by the University Court. Women are admitted to graduation in medicine under the same conditions as men.

Bachelors of Medicine and *Bachelors of Surgery* may proceed to the degrees of *Doctor of Medicine* and *Master of Surgery* after they have spent one year in the medical or surgical wards respectively of a hospital, or the Military or Naval Medical Services, or in scientific work bearing directly on their profession, or two years in practice. In each case an examination must be passed and a thesis submitted.

Post-graduate Instruction.—The University takes part in the Courses given under the auspices of the Edinburgh Post-graduate Courses in Medicine. In the departments of the Faculty of Medicine provision is made for research by students of graduate standing. In the University laboratories facilities will be provided for approved candidates for the Degree of Ph.D.

In connexion with the University and Royal Colleges Post-graduate Instruction is given each year, chiefly in the Summer Vacation (July–September). Special Courses are arranged for, and particulars may be had on application to the Hon. Secretary, Post-graduate Courses in Medicine.

The University of Edinburgh is especially rich in scholarships and prizes in medical subjects. Full particulars concerning these, as well as concerning the fees at different stages, can be obtained from the Dean of the Medical Faculty.

Edinburgh Royal Infirmary.

At this institution there are 1011 beds, including 42 cots for children. The clinical work of the Edinburgh student is done at the Royal Infirmary. Courses of Clinical Medicine and Surgery are given by the physicians and surgeons to male and female students. Special instruction is given on Diseases of Women, Physical Diagnosis, Diseases of the Skin, Diseases of the Eye, the Ear, the Larynx, and the Teeth. Separate wards are devoted to Venereal Diseases, Diseases of Women, Diseases of the Eye, the Ear, Throat and Nose, and the Skin, and also to cases of Incidental Delirium or Insanity. There is also a large and complete Radiological Department in which is given theoretical and practical instruction for the University Diploma in Radiology, &c. Post-mortem examinations are conducted in the anatomical theatre by the pathologist and his assistants, who also give practical instruction in Pathological Anatomy and Histology.

The appointments are: 1. Resident physicians and surgeons are appointed and live in the house free of charge. The appointment is for six months, but may be renewed at the end of that period by special recommendation. 2. Non-resident house physicians and surgeons and clinical assistants are appointed for six months. The appointment may be renewed for a like period by special recommendation. 3. Clerks and dressers are appointed by the physicians and surgeons. These appointments are open to all students and junior practitioners holding hospital tickets. 4. Assistants in the Pathological Department.

Facilities are given in connexion with the Post-graduate Courses arranged by the Edinburgh University and the two Royal Colleges jointly.

Royal Hospital for Sick Children.

The hospital at Sciennes-road, Edinburgh, has 132 beds, fitted with every modern improvement. A fully equipped out-patient department (medical and surgical) is conducted daily. Systematic courses of instruction, which qualify for graduation in the Edinburgh University and elsewhere, are given thrice throughout the year by the staff. Each course consists of 50 meetings and combines medicine and surgery. Post-graduate Courses of Lectures are held during the summer vacation. Full particulars with regard to teaching can be obtained from the Dean's Office, University New Buildings, Edinburgh.

Edinburgh Eye, Ear, and Throat Infirmary.

Clinical Lectures and Instruction are given in this institution (with which is incorporated the Edinburgh Eye Dispensary) at 6, Cambridge-street, Lothian-road, open at 1 o'clock daily for out-door patients for Eye Diseases; Mondays, Thursdays, and Saturdays at 12 noon, and Tuesdays and Fridays at 4 P.M. for out-door Ear, Nose, and Throat Patients. Patients whose diseases require operations or extra care are accommodated in the house (10 beds). Practical Ophthalmoscopic Classes may be arranged, and Clinical Assistants are appointed from time to time. A Post-graduate Course in Diseases of the Ear, Nose, and Throat is held each academic term, commencing in May, October and January, and continuing for six weeks. The next course commences in October. The class meets at 5 P.M. on Tuesdays and Fridays, and the instruction, which is practical, is supplemented by lantern demonstrations. Full particulars from the Secretary, 32, Charlotte-square.

UNIVERSITY OF GLASGOW.

The University of Glasgow is both a teaching and a degree-granting body, but admits to graduation only candidates whose preliminary examination and course of study conform to its own regulations. Within certain limits instruction given by recognised medical schools and teachers may be accepted, but not less than one-half of the subjects other than clinical must be taken in this or some other recognised university.

and at least two years of the course must be taken in Glasgow University. Seven degrees, open both to men and women, are conferred: *M.B.* and *Ch.B.* (always conjointly), *M.D.* and *Ch.M.*; *B.Sc.* in Public Health; *D.Sc.* in Public Health; *B.Sc.* in Pharmacy; and *Ph.D.* in the Faculty of Medicine. A Diploma in Public Health (*D.P.H.*) is also granted.

All information as regards the extent and standard of the Preliminary Examination may be obtained by application to the Secretary, Scottish Universities Entrance Board, 81, North-street, St. Andrews.

For the degrees of M.B. and Ch.B. a curriculum of five years is required. The candidate must attend a course or courses of instruction in each of the following subjects of study, extending over not less than the number of terms specified in each case, and including such class examinations as may be prescribed in connexion with the several courses:—Chemistry (including Organic Chemistry), with Practical Chemistry, three terms; Physics (with practical work), one term; Botany (with practical work), one term; Zoology (with practical work), one term; Anatomy and Practical Anatomy, five terms; Physiology and Practical Physiology, three terms; Materia Medica and Therapeutics (together or separately), each subject, one term; Pathology and Practical Pathology, three terms; Medical Jurisprudence and Public Health (together or separately), each subject, one term; Midwifery and Diseases peculiar to Women and to Infants, two terms; Surgery two terms; Medicine, two terms. Candidates must attend for at least three years the Medical and Surgical Practice of a recognised hospital accommodating at least 80 patients and having a distinct staff of physicians and surgeons. At least nine months' hospital attendance is required on both Clinical Surgery and Clinical Medicine with nine months more of general hospital practice; the student must have acted for six months as clerk in medical and dresser in surgical wards, and must have had six months' outdoor practice; he must also have attended a course of Mental Diseases and of Practical Pharmacy (25 meetings), must have been properly instructed in Vaccination at a public vaccination station, and must have attended at least 20 cases of labour and the Practice of a Lying-in Hospital. The University also requires further study in various special subjects: Ophthalmology, Diseases of the Ear, Throat and Nose, Venereal Diseases, Tuberculosis, Fevers, Vaccination. The final year consists of three intensive terms of study: one devoted to Midwifery and Diseases of Women, one to Surgery, and one to Medicine.

There are four Professional Examinations, the first comprising Botany, Zoology, Physics, and Chemistry; the second comprising Anatomy and Physiology; the third comprising Materia Medica and Therapeutics and Pathology; and the fourth or final, comprising Medical Jurisprudence and Public Health, Surgery and Clinical Surgery, Practice of Medicine and Clinical Medicine, and Midwifery and the Diseases Peculiar to Women and to Infants.

The degrees of M.D. (Doctor of Medicine) and Ch.M. (Master of Surgery) are granted to candidates, not under 24 years of age, who have previously obtained the double bachelorship, on completing examinations in Clinical Medicine for M.D., and in Surgical Anatomy, operations on the dead body, and Clinical Surgery for Ch.M. The higher degree of Doctor of Philosophy (Ph.D.) is also conferred in the Faculty of Medicine. Candidates must already have obtained a degree (or equivalent diploma) from an approved University or College, and must prosecute a course of special study or research for two or three years and give evidence of satisfactory progress. A thesis must be presented for approval by the Senate on the recommendation of a Special Committee. The candidate may be required to undergo an oral or other examination on the subject matter of the thesis.

Post-graduate Medical Teaching is available under the auspices of Glasgow Post-Graduate Medical Association, which is representative of practically all the Teaching Institutions in Glasgow. Weekly demonstrations for practitioners are given throughout the winter and spring, and comprehensive courses of instruction during the summer and autumn. There is a General Medical and Surgical Course during the last two weeks of August and the first two weeks of September. This is a whole-time course and includes most of the subjects of interest to the general practitioner. The forenoons are occupied with General Medicine and Surgical Diagnosis and Minor Surgery in the Royal Infirmary and in the Victoria Infirmary. In the afternoons special subjects are dealt with in some of the special hospitals or in the special departments of the general hospitals—two subjects each afternoon. On the four Saturday forenoons Tuberculosis and Infectious Fevers are demonstrated at Ruchill Fever Hospital. Arrangements have also been made whereby a limited number of graduates may become attached to wards or out-patient departments nominally as clinical assistants for definite periods throughout the year. As such they work under the direct supervision of the physician or surgeon in charge, and carry out detailed investigations as directed. Further information may be obtained from the Secretary of the Association, 9, Woodside-terrace, Glasgow.

There are many Bursaries, Scholarships, and Prizes in connexion with the Medical Course.

Glasgow Royal Infirmary.

The ancient connexion between the University of Glasgow and the Royal Infirmary was revived in 1911, when four University Chairs and several University Lectureships were established at the infirmary. New Lectureships in Materia Medica and Pathological Biochemistry were established recently, and a lectureship in Bacteriology has been founded. St. Mungo's College, which embraces and continues the original Royal Infirmary Medical School, is situated in the infirmary grounds. The infirmary has, including the Ophthalmic Department, over 800 beds. In addition to the large medical and surgical departments, there are special wards for diseases of women, of the throat, nose, and ear, skin, eye, burns, septic cases, biochemical investigation, and urology. The wards are open to Women Students. Six house physicians and nine house surgeons, who board in the hospital free of charge, are appointed every six months; also five non-resident house physicians, nine non-resident house surgeons, and one non-resident dental house surgeon. Clerks and dressers are appointed by the physicians and surgeons. As a large number of cases of acute diseases and accidents of a various character are received, these appointments are very valuable and desirable. There is a modern and fully equipped Electrical Pavilion and Massage Department, and School of Massage, and year by year the latest and most approved apparatus for diagnosis and treatment has been added. Post-graduate Classes are held during August and September in Clinical Medicine, Clinical Surgery, Clinical Gynæcology, Diseases of the Skin, Biochemistry, Diseases of the Throat, Nose and Ear, and in Diseases of the Eye. Tutorial Classes for senior students are also held in August and September.

For information regarding fees and other particulars, application should be made to the Superintendent.

Glasgow Western Infirmary.

This hospital of 642 beds adjoins the University. Special wards are set apart for Diseases of Women, Throat, Nose, and Ear, and for Affections of the Skin. In the out-patient department there are special clinics for Diseases of Women and for Diseases of the Throat, Ear, Nose, Teeth, Skin, Venereal Disease, and Electro-therapeutics. Radium centre for Glasgow and the West of Scotland. The Clinical Courses are given by the physicians and surgeons, each of whom conducts a separate class, and students require to enter their names at the beginning of the session for the class which they propose to attend. Special instruction is given to junior students by tutors or assistants, and clinical clerks and dressers are selected from the members of the class. All the courses of clinical instruction are recognised by the University of Glasgow and the other boards in the kingdom. In the Pathological and Bacteriological Departments the courses are both systematic and practical, and extend through the winter and following summer; these are likewise recognised by the University for graduation. In addition Post-Graduate Courses are held. Eighteen resident assistants are appointed annually from those who have completed their course. In the Clinical Laboratory students receive laboratory instruction from the lecturer on clinical methods. A School of Massage, Medical Electricity, and Swedish Remedial Exercises has been established to qualify for the Certificate of the Chartered Society of Massage and Medical Gymnastics. Secretary: J. Matheson Johnston, C.A.

Victoria Infirmary.

This institution, situated at Langside, and having its office at 67, Carlton-place, Glasgow, has 427 beds, and is the third of the extensive general hospitals in Glasgow to afford opportunity for clinical instruction to students. In addition to a full general staff there is a clinical research laboratory with pathologists and bacteriologists attached; radiological instructor, and a full assortment of specialists. The Bellahouston Dispensary, also with a clinical staff, is conducted in connexion with the Victoria Infirmary. For further particulars of the clinical practice application should be made to the Medical Superintendent.

Anderson College of Medicine.

Courses are given at Dumbarton-road, Glasgow, W., which qualify for all the licensing boards and for the Universities of Oxford, Cambridge, London, Durham, Edinburgh, and Glasgow (the latter two under certain conditions). Extensive accommodation is provided for Practical Anatomy, Practical Chemistry, Practical Botany, Practical Zoology, Practical Physiology, Practical Pharmacy, Operative Surgery, and Public Health. Ample provision has also been made for the comfort of students. Women students are admitted on the same terms as men, and the Carnegie Trust extends its benefactions to students of the College. (Full particulars may be obtained from the Carnegie Trust Offices, Merchants' Hall, Edinburgh.)

Candidates for the L.D.S. can obtain the full medical curriculum in Anatomy, Chemistry, Physiology, Surgery, Practice of Medicine, and Materia Medica. The courses special to Dentistry are conducted at the Dental Hospital, Glasgow.

Communications relating to the College to be addressed to the Secretary of the Medical Faculty. Communications relating to the Preliminary Examination in General Education to be addressed to the Educational Institute Office, 47, Moray-place, Edinburgh; and relating to the Triple Qualification and to the Dental Qualification to be addressed to Royal Faculty Hall, 242, St. Vincent-street, Glasgow.

Queen Margaret College.

Queen Margaret College (Women's Department of the University) is an integral part of the University of Glasgow. The classes are taught by professors of the University and other lecturers appointed by the University Court, and it is governed by the University Court and Senate. The curricula, regulations, and fees are the same as those of the male students, and the University degrees are open to women on the same conditions as to men. The school of medicine is a special feature of the College, and gives full preparation for the medical degrees of the University. The women students attend classes in the various University Buildings at Gilmorehill and Queen Margaret College, the Royal Infirmary, the Western Infirmary, and the Victoria Infirmary. Facilities for clinical work are given in the Royal, Western and Victoria Infirmaries, in the Maternity, Royal Sick Children's, and other hospitals. The Arthur Scholarship is open every third year to students of first year; other Bursaries are open in Arts and Medicine, and women are admitted to certain University bursaries and fellowships.

St. Mungo's College and Glasgow Royal Infirmary.

The classes in St. Mungo's College qualify for the medical qualifications of the English, Scotch, and Irish Conjoint Boards, for the dental diplomas of the English, Irish, and Scottish Boards and, under certain conditions, for the various universities, including the University of London. Students who have fulfilled the conditions of the Carnegie Trust are eligible for the benefits of this Trust during the whole course of their studies at St. Mungo's College. Further particulars can be obtained from the Secretary of the Medical Faculty.

Royal Hospital for Sick Children, Glasgow.

This institution consists of: (1) a hospital at Yorkhill containing 275 cots, built on an elevated and central site close to the University; (2) a Dispensary, or Out-patient Department, in West Graham-street; and (3) a Country Branch at Drumchapel, Dumbartonshire, containing 80 cots. Children treated must not be over 13 years of age, nor suffer from infectious diseases. In 1930 there were 5247 patients treated in the wards, and the number of attendances of out-patients was 89,103. There are one professorship and four lectureships in the University of Glasgow in connexion with the hospital, one professorship and one lectureship on the Medical Diseases of Infancy and Childhood, one lectureship on Surgery and Orthopædics in relation to Infancy and Childhood, one lectureship on Biochemistry in relation to Infancy and Childhood, and one research lectureship on the Pathology of the Diseases of Infancy and Childhood. The lectures are both systematic and clinical, but particularly and chiefly the latter. In addition, special facilities are given for post-graduate study. Resident House Physicians and Surgeons are appointed every six months, in April and October. Full information may be obtained from the Medical Superintendent.

Glasgow Royal Maternity and Women's Hospital.

The average daily number of patients in the hospital at Rottenrow is 140, and of the 4000 cases admitted to the wards per annum, over 60 per cent. are classified as abnormal. There are also about 3500 mothers attended per annum in their own homes. The work of the antenatal wards with their 40 beds is supplemented by large antenatal clinics where over 4000 new patients are seen in the course of the year. Splendidly equipped Research Laboratories were opened in 1926. The Visiting Staff of the hospital includes a Pædiatrician, who gives daily attendance. The practice of the hospital affords a wonderful field for post-graduate study and experience. Inquiries should be addressed to the House Superintendent.

Glasgow Royal Samaritan Hospital for Women.

Increased to 160 beds by building extensions completed in 1927, the hospital offers excellent facilities for clinical instruction in the diseases peculiar to women. Lectures and clinical demonstrations are given by members of the surgical staff to students and to post-graduates; and the hospital is represented on the Board of the Glasgow Post-Graduate Medical Association formed for coördinating post-graduate medical teaching in all the hospitals. The Royal Samaritan Lectureship in Gynæcology is a University Lectureship associated with the hospital.

For further information, application may be made at the hospital, or to the Secretary, 200, St. Vincent-street, Glasgow.

Glasgow Lock Hospital.

The hospital at 41, Rottenrow, Glasgow, contains 84 beds for the treatment of females suffering from Venereal Diseases. There is also a Labour Ward, and a [illegible] d [illegible]ensary for out-patient attendances. There is a Lecture Room and a Laboratory, equipped with modern appliances, where University classes on the subject are dealt with. Post-graduate classes are also held. Recently the hospital has been completely renovated and modernised. Full information from the Secretary and Treasurer, Mr. J. Neilson Gray, LL.B., 65, Bath-street, Glasgow.

Glasgow Ophthalmic Institution.

This institution, at 126, West Regent-street, and 131, Wellington-street (30 beds and six cots), is administered by the Royal Infirmary. Clinical and systematic courses of lectures for students during the winter and summer sessions. Operations on Wednesdays and Fridays. Post-graduate classes and demonstrations are arranged during the summer. For information regarding fees and other particulars application should be made to the Superintendent, Royal Infirmary.

Glasgow Eye Infirmary.

The wards and dispensary at Berkeley-street and Charlotte-street are recognised by the University of Glasgow for the purpose of instruction in ophthalmology for graduation in medicine, and by the Royal Colleges of Physicians and Surgeons of England for the Diploma in Ophthalmic Medicine and Surgery. A Venereal Centre has been established, and a Branch Dispensary has been opened in Clydebank. Post-graduate Classes are held. Secretary and Acting Treasurer, Mr. William M. Moore, 171, West Regent-street, Glasgow.

Glasgow Ear, Nose and Throat Hospital.

The hospital contains 54 beds. At out-patient and indoor departments at 306, St. Vincent-street, clinical instruction is given. A Research Department has been installed. Post-graduate Courses are held during the year. Secretary: D. N. Mackay, 38, Bath-street, Glasgow, C.2.

UNIVERSITY OF ST. ANDREWS.

Four Degrees in Medicine and Surgery are conferred by the University of St. Andrews (United College, St. Andrews and University College, Dundee)—viz., *M.B.*, *Ch.B.*, *M.D.*, *Ch.M.*, a Diploma in Public Health, Diploma in Dental Surgery (*L.D.S.*), and a Diploma in Public Dentistry.

The extent and standard of the Preliminary Examination is determined by the Scottish Universities Entrance Board, constituted under Ordinance No. 70 of the Scottish University Courts (General No. 3—Regulations as to Admission to the Scottish Universities for purposes of graduation), in accordance with the terms of that Ordinance. A degree in Arts or in Science in any of the Universities of the United Kingdom and in some colonial and foreign universities exempts. The Preliminary Examination for graduation in Medicine and Surgery, Arts or Science, of the University of St. Andrews is accepted as equivalent to the Registration Examination required by the General Medical Council (the certificate to include the required subjects). Also the Final Examination for a degree in Arts or Science.

Degrees of Bachelor of Medicine and Bachelor of Surgery.—A pre-registration examination is held in Physics and Chemistry. Candidates must have been engaged in medical study for at least five years. In each of the first four years the candidate must have attended at least two courses of instruction in one or more of the subjects of study specified below, each course extending over a session of not less than five months, either continuous or divided into two terms, or, alternatively, one such course along with two courses, each extending over a session of not less than two and a half months. During the fifth or final year the candidate shall be engaged in clinical study for at least nine months at the Infirmary of Dundee or at one or more of such public hospitals or dispensaries, British or foreign, as may be recognised for the purpose by the University Court. The candidate must have received instruction in each of the following subjects of study, *including such examinations as may be prescribed in the various classes*—viz., Anatomy, Practical Anatomy, Chemistry, Materia Medica, Physiology, Practice of Medicine, Surgery, Midwifery, and the Diseases peculiar to Women and Infants, Pathology, Bacteriology, Practical Chemistry, Physics, Elementary Botany, Elementary Zoology, Practical Physiology, Practical Pathology, Forensic Medicine, and Public Health. The candidate must have attended for at least three years the Medical and Surgical Practice either of the Infirmary of Dundee or of a General Hospital elsewhere with not fewer than 80 patients, with a distinct staff of physicians and surgeons, and recognised for the purpose by the University Court. Additional subjects of study are Practical Pharmacy, Mental Diseases, Practical Midwifery, Operative Surgery, Vaccination, Children's Diseases, Fevers, Ophthalmology, Diseases of the Ear, Throat, and Nose, Anæsthetics, Dermatology, Venereal Diseases, Tuberculosis, and Post-mortem Examinations.

With respect to the places and institutions at which the studies of the candidate may be prosecuted the following regulations shall have effect:—1. Two of the five years of medical study must be spent in the University of St. Andrews. 2. The remaining three years may be spent in any University of the United Kingdom or in any Indian, Colonial, or Foreign University recognised for the purpose by the University Court, or in such medical schools or under such teachers as may be recognised for the purpose by the University Court. Women are admitted to graduation in Medicine.

Professional Examinations for the Degrees of Bachelor of Medicine and Bachelor of Surgery.—Each candidate will be examined both in writing and orally, and also clinically where the nature of the subject admits, in the following divisions—viz., first, in Botany, Zoology, Physics, and Chemistry; second, in Anatomy and Physiology; third, in Materia Medica, Pathology and Bacteriology, Forensic Medicine and Public Health; and fourth, in Surgery, Clinical and Operative Surgery, Practice of Medicine and Clinical Medicine, and Midwifery and Gynæcology (Systematic and Clinical).

University College, Dundee.

The Medical School in St. Andrews University is carried on as follows. Part or whole of the medical curriculum of St. Andrews University must be taken here. Provision is made by St. Andrews University for instruction in the work of the first two years, including Anatomy and Physiology, in both St. Andrews and Dundee. The last three years of the curriculum must be taken in Dundee in University College, which is a constituent part of St. Andrews University.

Dundee Royal Infirmary.

In addition to the ordinary Medical and Surgical Wards (461 beds), there are special departments for Midwifery (In- and Out-door), for Diseases of Women, of Children, of the Eye, of the Ear, Nose, and Throat, and of the Skin; and for Clinical Pathology, Radiology, Electrotherapeusis, and Electrocardiography. A new Maternity Department, built at a cost of £37,000, has recently been opened. The Pathological Department is being reconstructed. Clinical teaching is given to male and female students by the Honorary Staff; post-mortem examinations are conducted by the pathologists. All courses of instruction are recognised by the University of St. Andrews and the other Universities and Boards of the United Kingdom. Ten Resident Medical Officers are appointed every six months. Clinical clerks and dressers are attached to the Physicians and Surgeons; and Students are appointed as assistants in the pathological department. Further information may be obtained from the Medical Superintendent.

UNIVERSITY OF ABERDEEN.

The University of Aberdeen grants four degrees in Medicine and Surgery—viz., *M.D.*, *Ch.M.*, *M.B.*, and *Ch.B.* The Degree of Doctor of Philosophy (*Ph.D.*) is also granted in the Faculty of Medicine.

Degrees of M.B. and Ch.B.—Candidates, before entering on the curriculum, must have passed the Preliminary Examination or hold a qualification recognised as exempting from such examination.

The curriculum for the degrees extends over a period of five years, during which attendance is required in the following subjects: Biology, Physics, Chemistry (Systematic and Practical), Anatomy (Systematic and Practical), Physiology (Systematic and Practical), Materia Medica and Therapeutics, Practical Pharmacy, Pathology (Systematic and Practical), Forensic Medicine, Public Health, Surgery, Medicine, and Midwifery.

Candidates must attend for at least three years the medical and surgical practice of a recognised hospital, they must have attended courses of at least nine months in clinical medicine and clinical surgery, and have acted as clerk in the medical and dresser in the surgical wards of a hospital. Attendance is required on the practice of a dispensary or the out-practice of a hospital and also on courses in Mental Diseases, Fevers, Ophthalmology, Post-mortem Examinations, Venereal Diseases, Tuberculosis, Radiology, X Ray, Therapeutics and Electrical Treatment, and Clinical Chemistry, and other special subjects. The candidate is also required to have been properly instructed in Vaccination and to have attended at least 20 Midwifery cases.

Degrees of M.D. and Ch.M.—Candidates for either of these degrees must already hold the degrees of M.B. and Ch.B. of Aberdeen. A thesis (in duplicate) has to be presented and an examination has to be passed in Clinical Medicine (or in some special Department of Medical Science) or Clinical Surgery, as the case may be.

Degree of Ph.D.—For this degree candidates must pursue a course of special study or research during a period of nine academical terms as Research Students in the University of Aberdeen or in any College or Institution that may be affiliated thereto. A Thesis (in duplicate) must be presented for approval.

A diploma in Public Health is granted by the University to graduates in Medicine of a University in the United Kingdom, after a special examination.

Scholarships and Prizes.—In the Faculty of Medicine of the University of Aberdeen there are the following Bursaries, Scholarships, and Prizes:—Bursaries: about 24 Bursaries (competition and presentation) are open each year, of £10 to £45 per annum in value, most of them being tenable for three years. Scholarships: five Post-graduate Scholarships, ranging in value up to £250 per annum. Prizes and Medals: 15 Gold Medals and Prizes for proficiency in special departments.

Aberdeen Royal Infirmary.

There are 366 beds. The main clinical work of the students is done in the infirmary with its general and special facilities, including a Department of Clinical Chemistry.

Aberdeen Royal Mental Hospital.

This hospital contains about 900 beds. The class of Mental Diseases meets at the University of Aberdeen, and clinical instruction is given at the hospital during three months in summer. Physician-Superintendent, Dr. R. Dods Brown.

Other Hospitals.

Students have the opportunity of attending the following institutions: City Fever Hospital, Sick Children's Hospital, General Dispensary, Lying-in and Vaccine Institutions, and the Ophthalmic Institution.

SCOTTISH MEDICAL CORPORATIONS GRANTING DIPLOMAS.

CONJOINT EXAMINING BOARD.

The Royal College of Physicians of Edinburgh, the Royal College of Surgeons of Edinburgh, and the Royal Faculty of Physicians and Surgeons of Glasgow have made arrangements by which, after one series of examinations, held in Edinburgh or Glasgow, or both, the student may obtain the diplomas of the three bodies. This is the Scottish Conjoint Board. The three bodies grant their Single Licences only to candidates who already possess legal qualifications in Medicine or Surgery.

The hospitals which are recognised by the Scottish Conjoint Board as places where professional study for their diplomas can be pursued are all those institutions which feed the medical faculties of the universities, as well as all the places which are recognised by the English and Irish Conjoint Boards.

Professional Education.—The candidate must produce certificates or other satisfactory evidence of having attended the following separate and distinct courses of instruction: Physics, three months; Elementary Biology, 2 terms; Elementary Inorganic and Organic Chemistry, 2 terms; Anatomy, Practical Anatomy, 5 terms; Theoretical including Biochemistry and Biophysics, 5 terms; Physiology, Materia Medica, 2 terms; Pathology (including Practical Pathology), 3 terms; Practice of Medicine, 2 terms; Clinical Medicine, 3 terms; Principles and Practice of Surgery, 2 terms; Clinical Surgery, 3 terms; Midwifery and Gynæcology, 2 terms; Diseases of Children, one term; Medical Jurisprudence, one term; and Public Health, one term. The certified attendance on lectures, demonstrations, and practical work must not be less than three-fourths of the total number of roll-calls. Every student undergoes a course of Practical Midwifery, but before attending at labours he is required to attend a course of lectures on Surgery and Midwifery and to hold the offices of Clinical Medical Clerk and Surgical Dresser. He must also attend for two and a half months' instruction in Practical Pharmacy; the certificate to be signed by the teacher, who must be a member of the Pharmaceutical Society of Great Britain, or the superintendent of the laboratory of a public hospital or dispensary, or a registered practitioner who dispenses medicines to his patients, or a teacher of Practical Pharmacy.

The student must attend for 27 months the Medical and Surgical practice of a public general hospital containing on an average at least 80 patients available for clinical instruction and possessing distinct staffs of physicians and of surgeons. He must act as Surgical Dresser and Medical Clinical Clerk for not less than nine months in the wards in each case, and receive practical instruction in administration of anæsthetics. He must attend for three months the practice of a public dispensary especially recognised by any of the above authorities, and three months' attendance at the out-patient department of a recognised general hospital. This attendance should be made after the student has passed the First and Second examinations.

Candidates are also required to attend the following three-monthly courses: Diseases and Injuries of the Eye; Insanity; Infectious Diseases; Gynæcology; Diseases of Children. The curriculum lasts for five years, the fifth year being devoted to clinical work.

There are four professional examinations:—

First Examination includes Systematic and Practical Biology, Chemistry and Physics.

The *Second Examination* must be Written, Practical, and Oral, and consist of the following subjects:—(1) Anatomy and Embryology, and (2) Physiology, including Histology (if not included in Anatomy).

Biochemistry, and Biophysics. Candidates may be admitted to this Examination on production of the necessary certificates of curriculum.

The *Third Examination* must be Written, Practical and Oral, and consist of the following subjects:—(1) Pathology, including Bacteriology and Morbid Anatomy, and (2) Pharmacology (Theoretical and Practical), including Pharmacological Chemistry, the Principles of Therapeutics, and Prescription Writing. Candidates may be admitted to this Examination on production of the necessary certificates of curriculum.

The *Final Examination* must consist of the following subjects[1]:—(1) Medicine, including Therapeutics, Applied Anatomy and Physiology, and Clinical Pathology with Practical Medicine; (2) Surgery, including Applied Anatomy and Physiology, Clinical Pathology, with Practical Surgery; (3) Midwifery and Diseases of Women, Clinical Obstetrics and Gynæcology, with Practical Midwifery; and (4) Medical Jurisprudence and Public Health. Medicine, Surgery, and Midwifery must be taken together, and Medical Jurisprudence and Public Health, and not earlier than on the conclusion of five Winters and five Summers of Medical Study, provided that a period of 36 months has elapsed since passing the Second Professional Examination. The Schedule for the Final Examination must contain a summary of the entire Course of Study, and, properly attested or proved by Certificates, must be lodged with the Inspector, and the fee paid, not later than one week before the examination. At the same time there must be produced a Certificate to show that the Candidate is not less than 21 years of age. No Candidate can be exempted from examination on any subject of the Final Examination (with the exception of Medical Jurisprudence and Public Health) unless he has already passed in the subject at this Board.

In addition to the Written and Oral Examinations all Candidates must be subjected to Clinical Examinations in Medicine, Surgery, and Midwifery and Gynæcology, which shall include the Examination of Patients, Physical Diagnosis, the Clinical use of the Microscope and of other instruments, Clinical Chemistry, Surgical Appliances, Bandaging, Surface markings, Skiagrams, &c. The Oral Examination include the recognition of specimens. All Candidates for the Final Examination must complete the three portions (Medicine, Surgery, and Midwifery) within a period of 19 months.

There are four periods of examination annually.

The Registrar in Edinburgh is Mr. David Thomson, 49, George-square; and the Registrar in Glasgow, Mr. Walter Hurst, 242, St. Vincent-street, to whom fees and certificates must be sent for the respective examinations, and from whom particulars of fees can be obtained.

School of Medicine of the Royal Colleges, Edinburgh.

The Lectures in this School qualify for graduation at Edinburgh and other Universities, for the Examinations of the Conjoint Boards of Edinburgh and Glasgow, London, and Dublin. The number of students attending varies from year to year, and for the past few years the average number has been about 600. In accordance with the Statutes of the University of Edinburgh one half of the qualifying classes required for graduation there may be attended in this School, the fees paid for such classes being the same as those for the corresponding University classes. Special classes of instruction for Dental students are included in the curriculum. Post-graduate courses are conducted in conjunction with the University. Further particulars regarding the School, also its calendar (price 8*d*., including postage), may be had on application to the Dean of the School, Surgeons Hall, Edinburgh.

ROYAL COLLEGE OF PHYSICIANS OF EDINBURGH.

In addition to the Diplomas granted by the Scottish Conjoint Board, the Royal College of Physicians grants its Single Licence to candidates whose names are already on the Medical Register.

The Royal College of Physicians of Edinburgh grants a *Membership* and a *Fellowship*.

Membership.—A candidate, who must be a Licentiate of a British or Irish College of Physicians, or a graduate in medicine of a University, approved by the Council, and 24 years of age, is examined in medicine, therapeutics, and in any branch of the departments of medicine specially professed, such as general pathology, psychology, public health, obstetrics, gynæcology, diseases of children, tropical medicine, or medical jurisprudence.

Fellowship.—The Fellows are selected from the ranks of the *Members*.

ROYAL COLLEGE OF SURGEONS OF EDINBURGH.

The Royal College of Surgeons of Edinburgh admits to the examination for its Single Licence any candidates who hold a Diploma in Medicine of any British, Indian, or Foreign university or of any British College of Physicians, or of the Society of Apothecaries of London or Apothecaries' Hall, Dublin, granted under the provisions of the Medical Act, 1886, whose preliminary examination and course of professional study is proved to be sufficient to fulfil the requirements of the College, or to those who have passed a full examination for any of the above. Female practitioners are admitted to the Licence of the College and also to the Fellowship, and the regulations apply to practitioners of either sex.

The College grants a diploma of Fellowship after examination to the holders of British surgical degrees or diplomas and the holders of recognised degrees of the Universities of Canada, Australia, and New Zealand.

The Fellowship.—Candidates must be 25 years of age and in practice for at least two years. The examination is written and viva voce, and includes surgery and surgical anatomy, operative surgery, and clinical practice. One optional subject must also be taken, the range of these specialisms covering nearly every branch of medicine. Candidates are not allowed to appear for more than three times at the examinations. One month's notice of intention to appear for examination must be given by the candidate to the College.

ROYAL FACULTY OF PHYSICIANS AND SURGEONS OF GLASGOW.

The Royal Faculty of Physicians and Surgeons of Glasgow grants a Fellowship and a Licence to be held separately. The Licence is granted as a separate qualification to qualified practitioners in Medicine after examination in surgery, including surgical anatomy and clinical surgery.

Fellowship.—The Fellowship of the Faculty is granted after examination in medicine or surgery, together with an optional subject, which may be anatomy or physiology, or be selected from any special branch of medicine or surgery. Fourteen days' notice must be given by the candidate to the Faculty. In certain circumstances Fellows may be elected as a mark of distinction. Registrar: Mr. Walter Hurst, 282, St. Vincent-street, Glasgow.

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[1] Candidates at the Final Examination may be examined on Diseases of Children, Fevers, Tuberculosis, Insanity, Skin Diseases, Diseases and Injuries of the Eye, Diseases of the Ear, Throat, and Nose, Radiology, Venereal Diseases, Orthopædics, Vaccination, and Anæsthetics.

MEDICAL EXAMINING BODIES AND SCHOOLS IN IRELAND.

UNIVERSITY OF DUBLIN, TRINITY COLLEGE (SCHOOL OF PHYSIC).

Matriculation.—University students take the Entrance of Trinity College and a Junior Freshman Term or a special Medical Preliminary; Extern Students, any examination recognised by the General Medical Council.

Pre-registration Examination in Elementary Physics and Chemistry.—Before beginning the five years' Medical curriculum students must pass an examination in elementary Physics and Chemistry. This examination is held at the end of September, in January, in March, and in July. Courses in preparation for it may be taken in the School of Physic.

Degrees in Medicine (M.B.), Surgery (B.Ch.), and Midwifery (B.A.O.).—Candidates for these degrees must be of B.A. standing and must be for at least five academic years on the books of the Medical School, reckoned from the date of registration. The Arts course may be taken concurrently with the Medical course, and the B.A. degree need not be taken before the final medical examinations, but the Medical degrees are not conferred without the Arts degree. The following courses must be attended:—(1) Botany, Zoology, Physics and Chemistry; Descriptive and Applied Anatomy; Histology, Physiology and Applied Physiology; Pathology and Bacteriology; Materia Medica and Therapeutics; Medical Jurisprudence and Hygiene; Practice of Medicine; Surgery; Midwifery and Gynæcology. (2) Three courses of nine months' attendance on the Clinical Lectures of Sir Patrick Dun's or other recognised Hospital; (3) Practical Vaccination, one month's instruction; (4) Mental Disease, three months; (5) Practical Midwifery with Clinical Lectures, including antenatal and Infant Hygiene Clinics, also not less than 20 personally conducted cases, five months, one of which must be as a resident intern student; (6) Ophthalmic Surgery, three months. Three groups of examinations have to be passed. Preliminary Scientific Examination, including Physics and Chemistry, Botany, and Zoology. Intermediate Medical, Part I., including Anatomy and Physiology, Biochemistry and Histology; Part II., including Applied Anatomy and Applied Physiology; and the Final Examination, which is divided into Part I., Materia Medica and Therapeutics, Pathology and Bacteriology; and Part II., Medicine, including Clinical Medicine, Hygiene, Jurisprudence, and Mental Diseases; Surgery, including Operative and Ophthalmic Surgery; Midwifery and Gynæcology. Part I. may be passed in the fourth year, and Part II. completed at the end of the fifth.

Doctor in Medicine.—A Doctor in Medicine must have passed all the qualifying examinations and must be a B.A of three years' standing. He must also submit a thesis and pass an Examination before the Regius Professor of Physic.

Master in Surgery.—A Master in Surgery must be a Bachelor in Surgery of the University of Dublin of not less than three years' standing and must produce satisfactory evidence of having been engaged for not less than two years from the date of his registration in the study or study and practice of his profession. He must then pass a special examination.

Master in Obstetric Science.—A Master in Obstetric Science must be a Bachelor in Obstetric Science of two years' standing, and must produce evidence of having been engaged in the study of Obstetric Medicine and Surgery during two years. He is then required to pass a special examination.

Diploma in Gynæcology and Obstetrics.—A post-graduate diploma is conferred upon registered medical practitioners who take a six months' course at the Rotunda Hospital or other recognised institution, a six months' course in Trinity College, and then pass a special examination. The minimum time required for the complete course is nine months.

Bachelor in Dental Science and Master in Dental Science.—The regulations under which these degrees are awarded can be obtained by application to the Registrar of the School of Physic.

All Degrees and Courses of Instruction are open to women students.

Scholarships and Prizes.—1. Medical and Surgical Travelling Prizes, £100, awarded in alternate years. 2. Bicentenary Memorial Prize, £30, awarded yearly, and given to the Travelling Prizeman. 3. Sir John Banks Prize and Medal. 4. Edward Hallaran Bennett Prize and Medal. 5. FitzPatrick Scholarship, awarded on results of Final Examination (interest on £1000). 6. Medical Scholarship, £20 per annum for two years, awarded in Chemistry, Physics, Botany, and Zoology. 7. Medical Scholarship in Anatomy and Physiology, £20 per annum for two years. 8. Henry Hutchinson Stewart Scholarships, one in Botany, Zoology, Chemistry, and Physics, and another in Anatomy and Physiology, awarded annually and valued at £10 per annum for three years. 9. Henry Hutchinson Stewart Scholarship in Mental Diseases, awarded from time to time, £50 per annum for three years. 10. John Mallet Purser Medal, awarded annually in Physiology. 11. Daniel John Cunningham Medal and Prize, awarded annually in Anatomy. 12. Begley Studentship, £40 per annum for four years, awarded annually. 13. Kingsmill Jones Memorial Prize, awarded annually in Natural and Experimental Science, £15. 14. O'Sullivan Memorial Scholarship, £48, awarded annually for excellency of record in school. 15. Adrian Stokes Memorial Fellowship, awarded every second year, the holder to carry out original work in Pathology and Bacteriology, about £320. 16. De Renzy Centenary Prize in Public Health, awarded annually, £15.

Post-graduate Instruction.—Arrangements have been made, with the approval of the Board of Trinity College, for a post-graduate course of instruction at the School of Physic during the autumn from Monday, Sept. 14th, to Saturday, Oct. 3rd. A limited number of members of the class can reside in college rooms and dine on commons. Women graduates can be accommodated at Trinity Hall.

HOSPITALS AFFORDING RECOGNISED PRACTICE.[1]

The following hospitals afford practice recognised by the Irish Universities and Corporations.

Sir Patrick Dun's Hospital.

Classes both in Medicine and Surgery are held each morning at Grand Canal-street, Dublin, from 9 o'clock from Oct. 1st till the end of June. Special classes for junior students will be held in the wards during the months of October, November, and December. A Resident Surgeon and Resident Physician, with salaries, are appointed annually. Six Resident Pupils are appointed every six months. Twelve Surgical Dressers and twelve Clinical Clerks are appointed each month. There are facilities for women students.

The practice of the hospital is open to all students, and the certificates are recognised by Dublin University, the National University, and Royal Colleges of Surgeons of England, Ireland, and Scotland. It is an official "Treatment Centre" for venereal diseases.

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[1] This list of the institutions recognised by the Conjoint Board of Ireland is supplemented in the regulations of the Colleges by those hospitals mentioned as recognised institutions in Scotland and England. The recognised facilities for clinical instruction in some of the Irish centres have been described.

Prizes and Medals.—Clinical medals and prizes amounting to about £21 each will be awarded in Medicine and in Surgery respectively in accordance with the will of the late Rev. Samuel Haughton, M.D., S.F.T.C.D. Candidates who fail to obtain these medals and prizes will be awarded special certificates in Medicine and Surgery provided they show sufficient merit.

Further information will be supplied by the Hon. Secretary to the Medical Board.

Adelaide Hospital.

Two Resident Surgeons and four or more Resident pupils are elected every six months.

Prizes.—The Hudson Scholarship, £30 and a Gold Medal, as well as the Hudson Prize, £10 and a Silver Medal, are awarded at the end of the session for proficiency in medicine, surgery, gynæcology, and pathology. In addition to this prizes are awarded in gynæcology and dermatology, and in clinical medicine and surgery for junior students. Wallace Beatty Memorial Bursaries are granted at the discretion of the Medical Board at the beginning of the Winter session. The certificates of attendance are recognised by all the Universities and licensing bodies in the United Kingdom.

Further particulars may be obtained from the Secretary of the hospital, Peter-street, Dublin.

Mater Misericordiæ Hospital.

This hospital, under the care of the Sisters of Mercy, containing 410 beds, is open at all hours for the reception of accidents and urgent cases. Clinical instruction is given by the Physicians and Surgeons at 9 A.M. daily. Ophthalmic Surgery is taught in the Special Wards and in the Dispensary. Surgical operations are performed daily. Connected with the hospital are extensive Dispensaries, which afford valuable opportunities for the study of general Medical, Dermatological, Surgical Diseases, and Accidents; a fully equipped Biochemical Laboratory, a modern Electro-Massage Department, an Electrocardiograph room, and Radiological Department. Instruction is given on Pathology and Bacteriology. Three House Physicians, eight House Surgeons, and 18 Resident Pupils are elected annually. Dressers and Clinical Clerks are appointed regularly and certificates given for merit. Leonard Prizes will be offered for competition annually. Certificates of attendance are recognised by all the Universities and licensing bodies in the United Kingdom. There is a Private Hospital for the reception of Medical and Surgical cases. A Training School and a Home for Trained Nurses are connected with the Hospital, and Nurses who have passed a qualifying examination can be obtained on application to the Lady Superioress.

Entries can be made with any of the physicians or surgeons, or with the Registrar, 31, Fitzwilliam-square, Dublin. Detailed information may be obtained from the Secretary, Medical Board.

Mercer's Hospital.

This hospital contains 120 beds for medical and surgical cases, and arrangements have been made with the medical officers of Cork-street Fever Hospital whereby all students of this hospital are entitled to attend the clinical instruction of that institution and become eligible for the resident posts. There is a large dispensary for out-patients and a modern X ray department. An electrocardiograph has been installed. Students of the hospital are permitted to attend the gynæcological department, where they receive practical instruction. There are special wards for the treatment and study of children's diseases. A gold medal is awarded annually to the best student. During the past few years the hospital has undergone extensive alterations in order to bring it up to modern requirements. A House Surgeon and a House Physician is appointed annually. There are six men and two women Resident Pupils, and Clinical Clerks and Dressers are appointed from members of the classes.

For further particulars apply to Mr. J. Owens, Hon. Secretary, Medical Board, 36, Lower Baggot-street, Dublin.

Richmond, Whitworth, and Hardwicke Hospitals.

These House of Industry hospitals, North Brunswick-street, Dublin, contain 345 beds—135 for surgical cases, 90 for medical cases, 78 for fever and other epidemic diseases, and an auxiliary wing with 42 beds, devoted mainly to throat, nose and ear, and skin diseases. Two Resident Physicians and two Resident Surgeons are appointed each half year. Resident Clinical Clerks are appointed each quarter, and it has always been the aim of the Medical Board to ensure that each student spends at least six months in residence. In addition, junior students are appointed as extern Clinical Clerks and Surgical Dressers. Women students are eligible on the same terms as men. Ample facilities exist for post-graduate work in the various special departments, as well as in general medicine and surgery. Extensive alterations and improvements have recently been made in the X ray, Electrotherapeutic, and Electrocardiographic Departments. Two open-air huts to accommodate ten patients have been erected in the spacious Whitworth grounds. A new students' residency has been opened recently. This contains facilities for 20 male and 8 female residents.

For further information apply to the Hon. Secretary, Medical Board.

Royal City of Dublin Hospital.

The hospital contains 158 beds and a special wing for the treatment of fevers and contagious diseases founded by the late Mr. Drummond. There is a large nursery where special opportunities are afforded for the study of diseases of children, both medical and surgical. There are also special wards for ophthalmic, aural, and gynæcological cases; also a department for the Erlangen Treatment by Deep Therapy. There is a largely attended out-patient department, where students are allowed to attend accidents and dress cases under supervision. Six resident pupils are appointed every three months. A House Surgeon and a House Physician are appointed annually.

For information apply to the Secretary.

Dr. Steevens' Hospital.

This hospital, at Dublin (Kingsbridge), contains 250 beds, of which 175 are now in use. There is accommodation for 10 resident pupils, each of whom is provided with a separate bedroom, and board is supplied by the hospital at a reasonable rate. There is an Electric Massage Department, a "Sun-Ray" and Diathermy Department, and an X Ray Department. There are also two V.D. wards and a largely attended V.D. Treatment Centre, as well as a large ward reconstructed and re-equipped and opened as open-air ward for tuberculous and other diseases of bone (25 beds) for females, two open-air verandahs for male surgical tubercular cases (14 beds).

All information with regard to the terms for such residency can be had from the Resident Surgeon at the Hospital. Secretary: E. D. F. Banks.

Dublin—Meath Hospital and County Dublin Infirmary.

The hospital contains 150 beds, available for clinical teaching, both medical and surgical. A separate Fever Block contains 40 beds. Special wards have been set apart for the reception of children.

Jervis-street Hospital, Dublin.

This hospital contains 120 beds and 50 beds are about to be opened. The operating theatre has been equipped with the latest appliances, and a new Radiological Department has been erected and the most modern type of X ray apparatus has been installed in it. Eight Resident Medical officers are appointed each year and facility is thus given to past students of the hospital to acquire experience as House Surgeons. Resident students are provided with apartments, fuel, and light, free of charge. Arrangements have been made by which students of the hospital can have special Fever Training in Cork-street Fever Hospital, free of charge.

Further particulars can be obtained from the Hon. Secretary to the Medical Board.

Rotunda Hospital.

The Rotunda Hospital, Dublin, is the largest combined gynæcological and maternity hospital in the British Empire. Over 4000 confinements are attended annually, and upwards of 1000 gynæcological patients admitted. Students can take out their necessary gynæcological and midwifery practical courses. The work of the hospital is carried on continuously through the year, and consists of daily clinical instruction in the maternity department, and examination and operations in the gynæcological department. Qualified students are given facilities for studying and assisting in the management of all abnormal cases so far as is practical. An antenatal dispensary is held three times weekly and all students are encouraged to attend. A special class in gynæcological examination and diagnosis is conducted by the Assistants to the Master. In addition there is a special class in operative obstetrics, limited in number. The pathological laboratory is under the supervision of a skilled pathologist, who gives special classes at intervals. There is a fully equipped X ray installation under the care of a competent radiologist. A ward has been opened for the treatment of infantile conditions, and is under the care of a pædiatrician, who gives instruction in the out-patient department, which is held daily. The appointments on the staff of the hospital are given to qualified past students of the hospital who have taken the L.M., and consist of Extern Assistants for six months, one being appointed every three months. From these the Assistants to the Master are appointed. Women students can reside in the hospital on the same terms as men. The mess room and sleeping quarters have been decorated recently and reading rooms are provided. The L.M. is granted by examination after a six months' course. Fees for Intern students: one month £6 6s., months other than the first £4 4s., three months £12 12s., six months £21. Special gynæcological class £2 2s. per month.

For further particulars apply to the Master, Dr. Bethel Solomons, F.R.C.P.I.

Coombe Lying-in Hospital.

The Coombe Lying-in Hospital and Guinness Dispensary for the Treatment of Diseases peculiar to Women, Dublin, contains 70 beds, and consists of two divisions, one of which is devoted to lying-in cases and the other to the treatment of diseases peculiar to women. Lectures are delivered, practical instruction given, and gynæcological operations are performed in the theatres daily. There is a general dispensary held daily, at which instruction is given on the Diseases of Women and Children. There is a special afternoon dispensary held by the Master and his assistants, at which practical instruction in gynæcology is given. There is no extra charge for attendance at this Dispensary. There is accommodation for intern pupils, who enjoy exceptional advantages of acquiring a thorough knowledge of this branch of their profession. Women students can reside in the hospital. Clinical assistants are appointed from amongst the pupils as vacancies occur. Certificates of attendance at this hospital are accepted by all licensing bodies. Students can enter for attendance at any time, but preference is given to those entering from the first day of the month.

Further particulars may be had on application to the Master or the Registrar at the Hospital.

National Maternity Hospital.

This hospital at Holles-street, Dublin, was established in 1894. The hospital consists of Intern and Extern Maternity, Gynæcological Wards, and a Dispensary for the treatment of Diseases of Women and Children and an antenatal and postnatal branch. Every facility is given for the carrying out of practical work. Undergraduate and post-graduate courses are arranged at any time. Certificates of attendance at this hospital are recognised by all the licensing bodies. Clinical lectures are given daily and Oral lectures four times per week. The L.M. Diploma is given by special examination, which is held three times a year.

Further particulars can be obtained from P. T. McArdle, Esq., M.B., the Master, or from the Secretary, Holles-street, Dublin.

St. Vincent's Hospital and Dispensary.

This hospital was established at Dublin in 1834, with 200 beds. Clinical Lectures in Medicine and Surgery are held from October to June. Special classes for Juniors from October to December. Pathological and Bacteriological Demonstrations are given every Thursday, and instructions in the use of Laryngoscope and Otoscope for senior students every Saturday. Medals and Prizes: the Bellingham gold medal in Medicine and the O'Ferrall gold medal in Surgery are offered for competition at the end of the summer session, as well as junior prizes, also the McArdle Memorial Prize, value £20. There are a large Extern Department and a new Pathological Laboratory.

Further particulars from Hon. Secretary Medical Board, Wm. Doolin, M.B., F.R.C.S., 2, Fitzwilliam-square, Dublin.

NATIONAL UNIVERSITY OF IRELAND.

Matriculation.—All students must pass a matriculation examination; the examination taking place in June and September in Dublin, and at certain local centres, includes five subjects, three of which must be Irish, English, and mathematics. All students must pass in Irish except students not born in Ireland, and other students whose home residence shall have been outside Ireland during the three years immediately preceding their matriculation; but all such students will be expected to attend a course of instruction in Irish Literature and History prior to obtaining any degree in the University. The following are the subjects for examination:—(1) Irish. (2) Latin. (3) Greek. (4) French. (5) German. (6) Italian. (7) Spanish. (8) Portuguese. (9) Welsh, or any other modern language approved by the Senate. (10) English. (11) Mathematics. (12) *History.* (13) Geography. (14) Applied Mathematics, or (15) Physics as an alternative. (16) Chemistry. (17) *Botany.* (18) Agricultural Science. (19) Commerce. (20) Music, and for women candidates only (21) Physiology and Hygiene. Students entering for degrees in Medicine or Dentistry, if not already registered by the General Medical Council, must take Irish, Latin, English, Mathematics, and a fifth subject.

The medical degrees granted are:—

M.B., *B.Ch.*, *B.A.O.*; *M.D.*, *M.Ch.*, *M.A.O.*, *Ph.D.*—Printed forms of application for admission to any medical examination may be had from "The Registrar, The National University of Ireland, Dublin."

The Constituent Colleges of the National University of Ireland at which the full curriculum for medical degrees can be obtained are University College, Dublin; University College, Cork; and University College, Galway.

University College, Dublin.

Matriculation.—Almost all the students of the College are matriculated students of the National University of Ireland. The pre-registration examination in physics and chemistry is taken after matriculation either at the beginning of or during the winter session. The course is of five years' duration and dates from the passing of the pre-registration examination.

Degrees of M.B., B.Ch., and B.A.O.—The First Examination includes Applied Physics, Applied Chemistry, Botany, Zoology, and Applied Biology. The examination may be taken in two parts: Part I., Physics and Chemistry; Part II., Botany and Zoology. Honours may be obtained only when both parts are taken as one examination. The Second Examination includes Anatomy and Physiology. Both must be passed at the same time. The Third Examination (Part I.) includes Pathology, Materia Medica, Pharmacology, and Therapeutics. Part II. (Third Examination), taken at the end of the Fourth Winter Session, includes Hygiene and Medical Jurisprudence.

The Final Examination in Medicine, Midwifery, Surgery, and Ophthalmology includes both the theoretical and the clinical branches. No student can enter for the M.B., B.Ch., or B.A.O. until the end of the fifth year after registration, when the curriculum has been completed. The degree of M.D. may be obtained either by examination or on published work.

A Post-graduate Summer Course is held each year, beginning about the middle of June. The D.P.H. Course extends over the year, beginning at the opening of the session.

University College, Cork.

In the School of Medicine students must have passed the Matriculation Examination of the University or some other recognised examination, and a preliminary examination recognised by the General Medical Council.

Medical Students who have passed the First Professional Examination of the Conjoint Boards of Ireland, England, or Scotland may be admitted to the rank of second-year students on making application to the Council. Similarly, students who have passed the Second Professional Examination of the same Boards may be admitted to the rank of third-year students; and those who have passed the Third Professional Examination of the Dublin Colleges, or of the Edinburgh Colleges and Glasgow Faculties, may rank as fourth-year.

The school is provided with physiological, toxicological, pathological, and pharmaceutical laboratories, materia medica, anatomical and pathological museums, as well as a collection of surgical and obstetrical instruments and appliances. There are dissecting-rooms, well-appointed physical, chemical, and biological laboratories, a large natural history museum in the adjoining building, and part of the College ground is laid out as a botanical garden. The plant houses are well filled with plants and are open to the students in the class of Botany. The Library contains about 70,000 volumes and is open daily during term time to students. The Medical Museum occupies a large room erected at the northern end of the medical buildings. There are Students' Clubs for men and women students of the College and various athletic clubs.

Residence of Students.—Students not living at home, or with relatives or friends, sanctioned by their parents or guardians, are required to live in a hostel or in recognised lodgings, and register their addresses each session. The Honan Hostel, adjoining the College, is equipped by private endowment. A number of sets of rooms, together with recreation and common rooms, are provided for lay students who may desire to live there. For full particulars apply to the Warden. The Ursuline Convent, Blackrock, has a house of residence, quite separate from their Secondary School, for Catholic women students.

Clinical Instruction.—Students may attend the South Charitable Infirmary and County of Cork General Hospital, Cork North Charitable Infirmary and City of Cork General Hospital, the Mercy Hospital, the Cork District Lunatic Asylum, the Victoria Hospital for Diseases of Women and Children, the County Lying-in Hospital, Bon Secours, Fever, the District, and Ear, Eye, and Throat Hospitals.

Complete information with regard to class fees, scholarships, and prizes can be obtained from the Dean of the Medical Faculty, and in respect of the hospitals from the Secretaries.

University College, Galway.

The College contains a well-lighted and ventilated dissecting room and an anatomical lecture theatre; physiological, pathological, pharmaceutical, chemical, and physical laboratories; anatomical, pathological, gynæcological, and materia medica museums; as well as large natural history and geological museums and an extensive library in which students can read and from which they can borrow books. In the School of Medicine there are 12 Entrance Scholarships, varying in value from £30 to £60 each, for which Medical Students compete with other students on the Entrance Course. In the Second, Third, and Fourth years three Scholarships in each year, value from £30 to £40 each, are reserved for Medical Students. H. H. Stewart Scholarships (£10 a year for three years) are awarded by the University in Anatomy and Physiology at Second Medical Examination amongst Students of the three constituent Colleges. Travelling Studentships (£200 a year for two years) are offered by the University for competition amongst Medical Graduates of the three Colleges of not more than two years' standing. Women students are eligible for all College and University Degrees, Distinctions, and Prizes. There are extensive grounds, a portion of which is occupied by a Botanic Garden and a portion is at the disposal of the College Athletic Union. There are several student societies in the College, including a Biological Society. There are adundant facilities for research and Post-graduate work in the Chemistry, Physiology, and Pathology departments. There are ample facilities for Women Students.

Further information can be obtained from the Registrar of the College.

Clinical Instruction is given in the Galway Tuberculosis Hospital and in the Galway Central and Fever Hospitals, containing on an average 350 patients.

Central Hospital, Galway.

In this completely renovated hospital (300 beds), in addition to the Finer Surgical and Medical Departments, there are now Eye and Ear, Throat and Nose, Gynæcological and Obstetrical, Pathological, X Ray, Ultra-Violet Rays, and Electrical and Massage Departments. Students attend from University College, Galway. Medical and Surgical Clinics are held on alternate days during term. One Resident Physician and one Resident Surgeon are appointed every six months. Resident Students are admitted. The hospital is open to qualified medical men for postgraduate work.

QUEEN'S UNIVERSITY OF BELFAST.

There are six degrees in the Faculty of Medicine of the University—viz., Bachelor of Medicine (M.B.), Bachelor of Surgery (B.Ch.), Bachelor of Obstetrics (B.A.O.), Doctor of Medicine (M.D.), Master of Surgery (M.Ch.), and Master of Obstetrics (M.A.O.) The University also grants a Diploma in Public Health and a Diploma in Psychological Medicine, particulars of which will be found in the University Calendar. The degrees of M.B., B.Ch., and B.A.O. are the primary degrees in the Faculty of Medicine, and are conferred at the same time and after the same course of study. No student is admitted to the final examination for these degrees until he has shown: (1) that he is a matriculated student of the University; (2) that he has completed the prescribed course of study in the Faculty of Medicine extending over a period of not less than five academic years from the date of his registration as a student of Medicine; (3) that he has passed the several examinations prescribed; (4) that he has attended in the University during three academic years at least the courses of study prescribed for such degrees (the Senate may accept, for not more than two academic years of the required five, courses of study pursued in any other University or School of Medicine approved by the Senate); and (5) that he has attained the age of 21 years. Every candidate for admission shall matriculate or fulfil such other test of fitness as may be prescribed by the Senate, or may be exempted from the matriculation examination by having passed similar examinations elsewhere.

For information as to Scholarships and Prizes, inquiry should be made of the Secretary of the University.

Primary Degrees of M.B., B.Ch., B.A.O.—All candidates for these degrees must satisfy the examiners in the subjects of four examinations.

The First Medical Examination.—The subjects of this examination are Chemistry (Inorganic and Organic), Experimental Physics, Botany and Zoology. The examination will be divided into two parts which may be taken separately: I., Chemistry and Physics; II., Botany and Zoology.

The Second Medical Examination.—The subjects are Anatomy and Practical Anatomy, Physiology and Practical Physiology. Candidates who have previously passed the First Medical Examination may present themselves for this examination at the close of their second year.

The Third Medical Examination.—The subjects are: (1) Pathology and Practical Pathology; (2) Materia Medica, Pharmacology and Therapeutics; (3) Medical Jurisprudence; (4) Hygiene. Candidates who have previously passed the Second Medical Examination may present themselves for Part I. of this examination at the close of the third year, and for Part II. at the end of the Winter Session of the fourth year. Attendance on a course in any subject of the Third Medical Examination shall not entitle a student to a certificate of attendance unless he has previously passed in all the subjects of the Second Medical Examination.

The Fourth Medical Examination.—The subjects are: (1) Medicine; (2) Surgery; (3) Midwifery; (4) Ophthalmology and Otology. This examination may be taken in two parts: I., Systematic; II., Clinical, Practical and Oral. Candidates who have previously passed the Third Examination may present themselves for Part I. of the Fourth Examination at the close of the fourth year, provided that they have fulfilled the necessary requirements as to attendance, &c., on the courses of instruction in the subjects of examination. Candidates who have passed Part I. of this examination may present themselves for Part II. at the close of the fifth year, provided that they have fulfilled the necessary requirements as to hospital attendance on the various clinical courses in the subjects of examination. Parts I. and II. may be taken together at the close of the fifth year. Attendance on a course in any subject of the Fourth Medical Examination shall not entitle a student to a certificate of attendance unless he has passed in the subjects of the Second Medical Examination.

Degrees of M.D., M.Ch., and M.A.O.—These degrees are not conferred until the expiration of at least three academic years, or in the case of graduates of the University in Arts or Science of at least two academic years, after admission to the primary degrees in the Faculty of Medicine. Every candidate must show that in the interval he has pursued such courses of study, or been engaged in such practical work as may be prescribed. These degrees may be conferred by the Senate either (*a*) after an examination, which includes written, oral, clinical, and practical examinations; or (*b*) on the submission of a thesis or other evidence of original study or research, to be approved by the Faculty of Medicine after an oral or other examination of the candidate on the subject.

The Medical School.—The Donald Currie Chemical Buildings contain a lecture theatre, a preparation room, a chemical museum, a large class-room for elementary practical chemistry, laboratories for qualitative and quantitative analysis, rooms for water and gas analysis, dark room for photographic purposes and balance room, provided with all modern appliances. The Anatomical Department contains a large and well-lighted dissecting-room, a lecture-room, a professor's and demonstrator's room, a bone-room, and a laboratory for microscopic and photographic work. The Medical Museum is in the same building. The Jaffé Laboratories for Physiology comprise a lecture theatre, laboratories for practical work in chemical physiology, histology, and experimental physiology, and in addition small private research rooms, including balance, galvanometer, and centrifuge rooms. The J. C. White laboratories, recently founded, are fully equipped for research in biochemistry and bacteriology. The Musgrave Pathological Laboratory.—In this department opportunity is afforded for research in pathology and bacteriology. The department is in touch with most of the hospitals in Belfast, and there is an ample supply of material for investigation by graduates in morbid histology, clinical pathology, and the bacteriology of infectious diseases. A course in pathology or bacteriology is given to graduates, and members of this class have an opportunity of seeing the methods employed in the various investigations carried out in the department for the Public Health Committee of the Corporation in connexion with water-supply, sewage disposal, meat- and milk-supply, and the diagnosis of cases of infectious diseases. The certificate issued to members of the class in bacteriology qualifies for the D.P.H. degree. The Pharmaceutical Laboratory is fitted and equipped for the work of practically instructing students in the compounding and dispensing of medicines.

Clinical Instruction.—The following institutions are recognised by the University as affording proper opportunities for clinical instruction: the Royal Victoria Hospital, the Mater Infirmorum Hospital, the Union Hospitals, the Belfast Hospital for Sick Children, the Belfast Maternity, the Ulster Hospital for Women and Children, the Ulster Eye, Ear, and Throat Hospital, the Belfast Ophthalmic Hospital, the Purdysburn Fever Hospital, and the Belfast District Lunatic Asylum.

Complete information can be obtained from the respective Secretaries.

Royal Victoria Hospital, Belfast.

There are 436 beds. Students eligible for McGrath, McQuitty, Malcolm, Coulter Smyth and Elwood Scholarships aggregate annual value £185. Twelve House Surgeons and House Physicians. Thirty-six resident pupilships, three months each, annually for Senior Students, of which a proportion is allotted to Women Students, Special Departments for Radiology, Clinical Pathology, V.D., Dermatology, Gynæcology, Vaccine Therapy, Electrocardiography, Dentistry, Radium Therapy.

Mater Infirmorum Hospital, Belfast.

This hospital contains 270 beds and is open at all hours for the reception of accidents and urgent cases. Clinical instruction is given daily by Physicians and Surgeons. Surgical operations are performed daily. The out-patient departments in Medicine and Surgery, also the special dispensaries for Gynæcology, Ear, Eye and Throat, Electrotherapeutics, Venereal Diseases are very largely attended and afford valuable opportunities to students for the study of those subjects. A House Physician and two House Surgeons are elected every six months. Resident pupils are admitted as the vacancies arise. Three Exhibitions and a Gold Medal are competed for annually in June. Certificates of attendance upon this hospital are recognised by all the Universities and licensing bodies in the United Kingdom.

Belfast Infirmary and Hospital.

There are 1700 beds. Clinical courses are given quarterly, and a course for D.P.H. in Hospital. Intern Venereal Clinic in Infirmary under Corporation scheme. Maternity Hospital recognised for Practical Midwifery training. Particulars may be obtained on application to the Hon. Sec. Visiting Medical Staff. Certificate of vaccination class recognised by Local Government Board. There is a department for Cancer with 32 beds, and X Ray and Bacteriological Departments.

Belfast Hospital for Sick Children.

At the hospital in Queen-street there are 45 beds. Clinical instruction is given. During the Winter and Summer Sessions Courses of Lectures are delivered on the Medical and Surgical Diseases incidental to Infancy and Childhood. Demonstrations in Ophthalmology and Pathology are given, and ample opportunities are afforded in the wards and in the Out-patient Department for gaining a practical and theoretical knowledge of the diseases of Infancy and Childhood. This Hospital grants Certificates in Diseases of Children, which are recognised by the various Examining Bodies. Certificates are also granted for post-graduate study. A Gold Medal is offered for competition at the close of the session.

Maternity Hospital, Belfast.

At this institution in Townsend-street there are 25 beds in constant occupation, and exclusively devoted to Midwifery and Antenatal conditions. There is also a large district. The Queen's University of Belfast have erected a Students' Hostel in connexion with the Hospital where six Students and Post-graduates are received each month. The University Tutor in Obstetrics resides in the Hostel and Students conduct their cases under his supervision. There is a large Antenatal Department and a Department for Venereal Diseases.

Communications should be made to the Hon. Secretary of the Medical Staff.

Ulster Hospital for Children and Women.

At this hospital in Templemore-avenue, Belfast (60 beds), clinical instruction is given to students in Diseases of Children, Gynæcology and Obstetrics. Special departments: Radiology and Actinotherapy, Eye, Ear, and Throat, Dental V.D. Clinic and Antenatal Clinic. Gold Medal awarded annually. Two House Surgeons appointed from students of hospital.

Benn Ulster and Belfast Ophthalmic Hospitals.

At the Benn Ulster Eye, Ear and Throat Hospital, Clifton-street (30 beds), and Belfast Ophthalmic Hospital, Great Victoria-street (30 beds), practical demonstrations by the staff and occasional clinical lectures in the subjects of Ophthalmology, Otology, and laryngology are given. Clinical instruction is given daily.

Belfast Fever Hospitals.

City Fever Hospital, Purdysburn (360 beds); Union Fever Hospital (200 beds). Clinical Classes are held during the winter and summer sessions. Post-graduate (D.P.H.) Classes are also held.

Dr. A. Gardner Robb, Lecturer and Medical Superintendent.

Belfast Mental Hospital.

Purdysburn Villa Colony. (1350 beds.) University Lectures and Clinics.

IRISH MEDICAL CORPORATIONS GRANTING DIPLOMAS.

CONJOINT EXAMINING BOARD.

The Conjoint Board of the Royal College of Physicians of Ireland and Royal College of Surgeons in Ireland requires of candidates the passage either of its own preliminary examination in the subjects of general education or proof that the candidate has passed one of the tests accepted by the General Medical Council as well as passing in the Pre-Registration Examinations in Chemistry and Physics and Biology.

Professional Examinations.—There are three professional examinations, the first of which cannot be completed earlier than the end of the second winter session, nor the final before the conclusion of full five years of medical study. Before being admitted to any of them the candidate must show that he has studied the different subjects in practice and theory for the requisite periods, certificates to this effect being accepted from the authorities of most of the recognised medical schools at home and abroad.

The first examination consists of Part I. (*a*) Biology, (*b*) Applied Chemistry and Physics; Part II., Anatomy and Physiology. The second examination deals with (*a*) Pathology, (*b*) Materia Medica, Pharmacy, and Therapeutics and Ophthalmology, and may be taken separately.

Final Examination.—This is divided into three divisions, which cannot be completed until at least five years have passed in medical studies other than those for the Pre-Registration Examinations, and five years at least since the beginning of the curriculum. The divisions are (*a*) Medicine, including Fevers, Mental Diseases, and Diseases of Children; (*b*) Surgery, including Operative Surgery; (*c*) Midwifery, including Diseases of Women and Children, and the Practice of Vaccination.

Diploma in Psychological Medicine.—There are two examinations in connexion with this Diploma: Part I. consists of (*a*) Anatomy and Physiology of the Nervous System; (*b*) Psychology. Part II.: (*a*) Neurology, including Clinical and Pathological Neurology; (*b*) Psychological Medicine, including its legal relationships.

Further information can be obtained from the Secretary of the Committee of Management, Royal College of Surgeons, St. Stephen's Green.

ROYAL COLLEGE OF PHYSICIANS OF IRELAND

The College issues its Licences in Medicine and in Midwifery to practitioners whose names appear on the Medical Register of the United Kingdom.

The Licence in Medicine.—The subjects of examination are: Practice of Medicine, Clinical Medicine, Pathology, Medical Jurisprudence, Midwifery, Hygiene, and Therapeutics.

The Licence in Midwifery.—Candidates must produce certificates of registration. A registered medical practitioner of five years' standing may be exempted from the examination by printed questions.

The Membership.—Examinations for Membership are held in February, June, and November.

The Fellowship.—Fellows are elected by ballot. Applicants must have been a Member of the College for at least one year and must have attained the age of 27 years.

Further particulars can be obtained from the Registrar of the Royal College of Physicians of Ireland, 6, Kildare-street, Dublin.

ROYAL COLLEGE OF SURGEONS IN IRELAND.

The College issues its Licence in Surgery to practitioners whose names are entered either on the Medical Register for the United Kingdom, the Colonial Medical Register, or the Foreign Medical Register of the year in which he presents himself for examination, and who satisfies the Council that he has passed through a course of study and Examinations equivalent to those required by the Regulations of the Irish Conjoint Board.

Candidates are examined in General Surgery (paper and oral), Clinical Surgery, Surgical Pathology (oral), Operative Surgery, Surgical Anatomy (paper), and Ophthalmic and Aural Surgery (clinical).

Diploma in Midwifery.—A diploma in Midwifery is granted after examination to persons possessing a registrable qualification.

Fellowship Examinations.—Candidates for the Fellowship shall make application to the President and Council to be admitted to examination. They are required to pass two examinations—Primary and Final. Candidates may present themselves for the Final Examination immediately after passing the Primary part, provided they have complied with the necessary regulations. The subjects for the Primary Examination are (*a*) Anatomy, including Dissections; and (*b*) Physiology and Histology. The subjects for the Final Examination are Surgery, including Surgical Anatomy and Pathology For admission to the Final Examination the candidate must have passed the Primary Examination, and must be a Licentiate or Graduate in Surgery of a university or licensing body recognised by the General Medical Council; all such candidates must not be less than 25 years of age.

Further particulars can be obtained from the Registrar of the College, Stephen's-green West, Dublin.

Schools of Surgery.

The Schools of Surgery are attached by Charter to the Royal College of Surgeons and have existed as a department of the College for over a century. They are carried on within the College buildings and are specially subject to the supervision and control of the Council, who are empowered to appoint and remove the professors and to regulate the methods of teaching pursued. The buildings have been reconstructed, the capacity of the dissecting-room nearly trebled, and special pathological, bacteriological, public health, and pharmaceutical laboratories fitted with the most approved appliances in order that students may have the advantage of the most modern methods of instruction. The entire building is heated by hot-water pipes and lighted throughout by the electric light. Winter Session commences in October; Summer Session in April. Scholarships and Prizes: Carmichael Scholarship, £15; Mayne Scholarship, £8; Stoney Memorial gold medal; Operative Surgery, gold and silver medals; Pierefoy Memorial Prize, value £150; Barker Prize, £26 5*s.*; H. Macnaughton-Jones gold medal in Obstetrics and Gynæcology; and class prizes and medals. Prospectus and guide for medical students can be obtained post free on written application to the Registrar, Royal College of Surgeons, Stephen's-green W., Dublin.

APOTHECARIES' HALL OF IRELAND.

The Licence of this Hall is granted to students who present certificates of having fully completed the course of study as laid down in the curriculum and who pass the necessary examinations. The diploma of the Hall entitles the holder to be registered as a practitioner in medicine, surgery, and midwifery, with also the privileges of the Apothecary's Licence.

Candidates must pass two Professional Examinations, called the Primary Examination and the Final Examination, which are conducted at separate times, partly in writing, and partly practically and orally. The Primary and Final Professional Examinations are held twice a year—viz., in June and January, or such other dates as may be determined.

Candidates who produce satisfactory evidence of having passed an examination for a Degree or Licence in Medicine, conducted by any University or Royal College in the British Empire, or by any Foreign University whose Degrees are recognised in the Foreign List of the Medical Register, will be exempted from the Primary Examination.

The subjects for Part I. of the Primary Examination are: Anatomy, Physiology and Histology, including Bio-Chemistry; and for Part II., Materia Medica and Pharmacy, Pathology, and Medical Jurisprudence and Hygiene.

For the Final Examination the subjects are: (*a*) Medicine and Clinical Medicine and Clinical Methods. (*b*) Surgery—Clinical, Ophthalmic and Operative; and Surgical Anatomy. (*c*) Midwifery and Gynæcology, and Practical Pharmacy and Materia Medica (if not taken at Intermediate Examination).

Each candidate before receiving his diploma must produce evidence that he has attained the age of 21 years. The details of the course of education required and syllabus of the examinations will be supplied by the Registrar at 95, Merrion-square, Dublin.

PHARMACEUTICAL SOCIETY.

THE SCHOOL OF THE PHARMACEUTICAL SOCIETY OF GREAT BRITAIN is recognised by the University of London. The Society conducts examinations for registration as (*a*) Chemist and Druggist and (*b*) Pharmaceutical Chemist. Courses of Instruction are given for these examinations, in the latter case in conjunction with University College.

An Intercollegiate two years' course for the Final Examination for the degree of B.Pharm. of the University of London is also given in conjunction with University College. Medical students are admitted to the lectures and laboratory work in any or all the courses. Certificates of instruction in the School are received by the Conjoint Board of the Royal Colleges and by the University of London. Graduates of approved Universities may carry out the research work necessary for the thesis for the Ph.D. of the University of London in the Society's Research Laboratories; this degree may now be taken in Pharmacognosy or Pharmacy in the Faculty of Medicine. Several scholarships are also offered. Further information may be obtained from the Dean Prof. Greenish, 17, Bloomsbury-square, London.

WE take this opportunity of thanking the officials of Government Departments and the Deans and Secretaries of the various institutions for their kind coöperation in enabling us to bring the information contained in our Students' Number up to date.

THE GUILD OF ST. LUKE was founded 66 years ago by a few medical students, chiefly to meet their own religious needs. It now makes a wider appeal, and its membership is open to all students and practitioners of medicine, both men and women, who are members of the Church of England, the clergy of which are eligible as Clerical Associates. The Chapter meets in every month of each term, and a festival service is held yearly at St. Luke's tide. This year the service will be held in St. Paul's Cathedral, on Tuesday, Oct. 21st, at 8 P.M. Besides the parent Guild, there are a Women's Ward and a Hospital Student's Branch in London. There are also Provincial Wards in important Centres, and it is expected that many others will be established. Particulars of the objects and activities of the Guild can be obtained on application to the Secretary, Guild of St. Luke, King's College, Strand, W.C.2.

SAFETY FIRST.

THE medical practitioner has no more urgent need than that of protection against the legal risks arising out of his professional life. It is never too early for a doctor to consider these risks, and it is useful that the senior student should be aware of them, so that he may make up his mind to annul them as soon as his duties call him into relation with the public.

The commonest situations in which the doctor is called upon to refute charges, which may be either openly made against him in law courts, or privately circulated against him to his detriment, are connected with accusations of unskilfulness or negligence. He may be compelled to answer those charges in a law court as a defendant, when he will be punished by the verdict if his defence is unsatisfactory. Or he may be put to serious inconvenience, and loss of professional status and income, if he does not take steps to arrest statements made to his detriment, in which circumstances, also, his appearance in a law court may be necessary this time as the prosecutor in an action for libel or slander. In either case he may incur expenses over which he will have little control, and which may be very heavy, while he will require throughout legal advice as to procedure. The value of this advice will much depend upon how far he is able to assist in the production of evidence, and especially upon any terms of settlement by which a satisfactory conclusion may be reached.

The practitioner may be charged with negligence as a sequel to any diagnosis or any surgical interference, but when these accusations are grouped under headings it will be found that the majority of them fall into two classes. Any dissatisfied patient, who has suffered or who is suffering in any way whatsoever, may attribute either the prolonged disability or the imperfect recovery to faulty diagnosis or wrong surgical methods. The treatment of fractured bones gives rise to the majority of the serious claims for damages. It is here that the alleged failure of the doctor to recognise the real injury is most often made the basis of a charge of incompetence, and it is here that the doctor most urgently requires legal guidance. Sometimes patients, who feel an honest sense of grievance, proceed against the doctor to recover pecuniary damages for unfortunate conditions which they believe to be due to his conduct of their case, and the claims for money may be very large where the patient is no longer able to earn the income which he gained formerly. But many of these charges against the doctor are not honest at all; they are made with the intention of avoiding payment for services received. The dispute may arise in the first instance through ignorance on the part of the patient as to what the best medical service could have done for him, but it will be persisted in through the desire to escape the payment of legitimate claims, or, and worse, through the intent to extort money. No one who is not a lawyer can estimate the factors which will determine the issue of such cases in a law court or the circumstances which make a settlement out of court the fitting course to take—least of all the accused practitioner. Secondly, the medical man may at any moment have to decide whether he will become a legal prosecutor when suffering under libel or slander. All doctors are particularly liable to damage by loose reflections on their skill and conduct, and while they should not pay undue attention to idle gossip a passive attitude cannot always be maintained, and it may become necessary for the doctor to clear his character openly. Success here will depend in an important measure upon the preliminary steps taken, and where the defamed man, smarting under wrong, acts impulsively he may not only fail to put himself right in the public eye, but may actually worsen his plight.

Such are the two outstanding perils which may arise in the professional life of any doctor, and for his protection there exist in this country three great societies, The London and Counties Medical Protection Society and the Medical Defence Union, working upon identical lines in England, while the *Medical and Dental Defence Union of Scotland* guards the doctors of North Britain. These societies are in a sound pecuniary position; they have a large membership; and have a reasonable expectation of increasing their numbers, for in spite of all that happens in the law courts from year to year, and all that is reiterated in the medical press, a number of medical and dental practitioners still do not avail themselves of the security which the societies offer. At the last annual general meeting of the Medical Defence Union, the President, the late Sir Herbert Waterhouse, warned the assembly that accusations and claims against medical practitioners had increased in frequency, while he considered that with the changed conditions of medical practice this increase might be more rapid in the future. Sir Herbert Waterhouse was deeply interested in defence questions, was an assiduous chief of the big organisation over which he presided, and his views have to be taken seriously. Much dissemination of loose statements in the press leads the public to form wrong views and estimates upon medicine, and the rapid conclusions adverse to doctors, thus encouraged, find expression in ill-founded accusations, which are circulated even among educated people. The panel patient is not, in bulk, highly educated, and the approved societies are not, as a rule, unwilling to receive charges against medical practitioners, so that the extension of the work of both the defence associations, which has taken place of late, can only be expected. And the experiences of both of them during the year past reveal how baseless most of the charges brought against medical practitioners are, for it is common experience that proceedings for malpraxis are dropped as soon as it is known that one of these bodies is prepared to defend the practitioner, while in the cases which come to be heard in the courts a verdict is usually returned in favour of the doctor. Both societies emphasise the liability to a charge of incompetence in connexion with the treatment of fractures. Here the patient who dissatisfied with the results of treatment alleges that either it was wrong or the diagnosis was wrong, or both. If the doctor has submitted the injury to X ray examination before stating a diagnosis and undertaking treatment, the defence is usually rendered simple. But if this precaution has not been taken, and a radiogram later appears to conflict with what is stated to be the original view of the doctor, the defence becomes difficult. It is essential in the interests of all concerned that cases of suspected fracture or dislocation should undergo X ray examination preliminary to treatment; if the patients decide against the precaution being taken the responsibility for the future results becomes theirs, but the doctor should keep a record of the fact that his prudent advice has been offered and has not been followed.

The report of the London and Counties Medical Protection Society contains detailed instances where it was impossible for the practitioner to ignore the accusations made against him, and the report of the Medical Defence Union provides similar stories. These painful situations can be cleared up nearly always to the advantage of the practitioner if his defence is conducted promptly along legal lines. These risks to the practitioner begin the moment that he is qualified and recur to the end of the professional career. If the practitioner is very young the charges may be based upon his alleged inexperience as a youth; if he is a senior the suggestion may be made that he is past his work. Both the societies have the same experience in that doctors find their first impulse to obtain protection when the particular need for it arises. That is too late. The societies are insurance societies and in justice to their constituencies cannot defray the legal expenses of persons who are not subscribing members at the time when the trouble arises. It is never too soon to join one of the defence associations.

THE LANCET.

LONDON: SATURDAY, AUGUST 29, 1931.

SAFETY SECOND.

THE present issue of THE LANCET is published as a guide to those who would be doctors, advising them how and where they should study; it is addressed also to any who are already studying, illustrating the careers before them, and whither post-graduate work may lead them. This page is the dividing line between the two sections of the issue, and it was long the custom to make at this point some reflections on medicine as a career which might help parents to choose wisely for their children. To-day the children choose, and to those who have made the choice no finer encouragement can be offered than that contained in words, spoken rather more than 50 years ago, by WILLIAM OSLER, at the opening of a medical session at McGill University:—

> "Some will tell you that the profession is underrated, unhonoured, underpaid, its members social drudges—the very last profession they would recommend a young man to take up. Listen not to these croakers; there are such in every calling, and the secret of their discontent is not hard to discover. The evils which they deprecate, and ascribe—it is difficult to say to whom—in themselves lie; evils, the seeds of which were sown when they were as you are now (students); sown in hours of idleness, in inattention to studies, in consequent failure to grasp those principles of their science without which the practice of medicine does indeed become a drudgery, for it degenerates into a business. I would rather tell you of a profession honoured above all others; one which, while calling forth the highest powers of the mind, brings you into such warm personal contact with your fellow men that the heart and sympathies of the coldest nature must needs be enlarged thereby. For, *consider the practical* outcome of all you gather; the active work for which your four years' study is a preparation. Will not your whole energies be spent in befriending the sick and suffering? in helping those who cannot help themselves? in rescuing valuable lives from the clutch of grim death? in cheering the loving nurses of the sick, who often hang upon your words with a most touching trust? Aye! and in lessening the sad sum of human misery and pain by spreading, so far as in you lies, the knowledge of those grand laws of health transgressed so ignorantly and yet avenged so fatally?"

We have gone back half a century to recapture the almost evangelical fervour with which OSLER as a young man spoke of the profession of medicine and which he retained throughout his life. We speak to those who have already chosen that profession, and the decision may have been rendered difficult by the general and special economic position. It may be worth while to set aside for the moment prudential considerations and to dwell on the medical career in terms of adventure and enterprise. To give point to such reflections we may take a few examples from the lives of men and women who were just showing their fine promise at the time when OSLER gave his address, and whom we have lost but lately. By their pioneer work in physiology and pharmacology, W. D. HALLIBURTON and W. E. DIXON have helped to open the way for an orderly approach to clinical medicine; J. LORRAIN SMITH has done the same through pathology; MARTIN FLACK has applied physiological principles to flying, and reduced its dangers; E. B. TURNER has infused a robust athleticism into countless young lives and redeemed them from sloth and vice; ETHEL BENTHAM has been the first woman to speak for medicine in the House of Commons; ANDREW BALFOUR has grappled with the health problems of empire and made them appear not incapable of solution. For the most part these people found opportunities where others have found little but routine or conformity to precedents. A profession animated by such vitality would not be content to leave the medical staffing of the services where it stands to-day. There was a time when those services which demanded residence abroad attracted the picked men of the training schools, but the medical department of the Army is now 20 per cent. below strength. The medical services in India are being starved by the fear of what political change may bring; yet they hold great possibilities for those who are not deterred by the element of risk. The colonial services, again, offer positions of interest and responsibility which become every year more varied and important. Medical science has already turned much of the West Coast of Africa from pestilence-ridden wilds into reasonably, and sometimes remarkably healthy places, and it would take a lively imagination to foreshadow what conquests are still before medicine in making the colonies, protectorates, and dependencies a safe outlet for our surplus population.

Not that adventure is lacking in the prospect of medicine at home. It may be that the surgical technique which enthralls every third-year student has reached its fastigium, but our greatest surgical experts tell us that this is the dawn of a new period of preventive surgery in which the whole profession will play its part. The opening up of municipal hospitals is likely to provide opportunities for consultation and orderly team-work which will make general practice more satisfying and efficient. All these departments of medicine, indeed, are what we make them—an old and sensible platitude. But the profession will be richer, and the lives of its members richer, if it shows a greater boldness and does not follow too closely the present fashion of counting the cost.

THE MEDICAL SERVICES

NAVAL MEDICAL SERVICE.

There is no change in the position of the naval medical officer that it is necessary to mention. The service needs recruits, but there always will be a certain number of young medical men to whom life in the Royal Navy appeals. To the man brought up in Naval surroundings or with Naval relations a career as a Medical Officer in the Royal Navy offers very definite attractions. In these days his professional knowledge will most certainly not rust anywhere; but especially in the Naval Hospitals will he have opportunities of practising every branch of his profession, except, of course, diseases of women. He can obtain one of the 60 paid specialist appointments. These include medicine, surgery, diseases of the eyes, diseases of nose, ear and throat, radiology, anæsthetics, genito-urinary and venereal diseases, physical training, bacteriology, pathology, and hygiene. He will be encouraged to work hard and play hard. He will see the world under ideal conditions.

The right type of man for a Naval Medical Officer is a good doctor, keen on his work, keen on his play, and unselfish. If the doctor is of this type he is invariably everybody's friend. The Naval Officer and the blue-jacket are quick to recognise a Medical Officer who is keen on his work, thoughtful of his patients, and one who strives after improving the health of the Navy. Such a Medical Officer finds life agreeable, as everyone is ready to befriend him, and nowhere can one find more delightful friends than in the Navy.

Officers who have held appointments as Medical or Surgical Officers in Civil Hospitals for any period prior to entry, after qualifying, are eligible under the regulations to have their seniorities antedated by not more than one year.

To help men to take higher qualifications opportunities are given, when the exigencies of the Service will permit, for medical officers to take post-graduate courses prior to sitting for these higher examinations. A large number of Naval Medical Officers since joining the Navy have taken qualifications such as M.D., F.R.C.S., M.R.C.P., D.P.H., D.T.M., D.O.M.S., &c. It is recognised that this is good for the Navy and good for the officer himself.

WORK OF THE NAVAL MEDICAL SERVICE.

In our large Naval Hospitals the medical, surgical, and specialist work is of a very high standard. The work is very exacting, and it is the aim of the Admiralty to arrange appointments as far as possible so that medical officers have an opportunity of alternating their work, not only at home and abroad, but also ashore and afloat.

To give Naval Surgeons opportunities for professional work has always been a very definite policy of the Admiralty, and within the last year or so this matter has received still further attention.

The General and Specialist Courses have been increased so that, as far as possible, every officer shall have a course of instruction of not less than four months' duration every four years. The number of specialists allowed is now 60 and the specialist allowance is 5*s.* a day.

The total number of Medical Officers in the Navy is about 400, including 1 surgeon Vice-Admiral (Medical Director-General), 6 Surgeon Rear-Admirals, and 20 Surgeon-Captains, and every improvement has been made towards giving increased opportunities of advancement and accelerated promotion to the best men.

The advantages of a career with its period of strenuous clinical work, followed by a period of comparative leisure which can be devoted to study, &c., are laid stress on in the Presidential Address of the War Section of the Royal Society of Medicine delivered on Oct. 10th, 1927.

The work and professional opportunities of the Service Medical Officer are described, but the address is necessarily brief, and it is only by reading between the lines that one can really visualise the field for work which lies before the keen Naval Doctor.

Not only has he this purely medical work to interest him. He has opportunities to emulate some of the great Naval Surgeons of the past, such as Darwin, Huxley, and many others, who have contributed so much to science.

MEDALS AND PRIZES.

Gilbert Blane Medal.—This Medal is awarded annually to the Surgeon Lieutenant Commander who obtains the highest aggregate marks at the examination for promotion to the rank of Surgeon Commander. The award is subject to the approval of the Presidents of the Royal College of Physicians and Surgeons respectively and the Medical Director-General o the Navy.

Other awards and prizes open to Naval Medica Officers are the Chadwick Naval Prize, the North Persian Forces Memorial Medal, and the Parke Memorial Prize.

PLAY IN THE NAVY.

Recreation is a vital part of the Navy, and there is no branch of athletics or field sports in which the Nava Officer does not have an opportunity of trying hi hand. Not only is the champion encouraged bu also the less proficient.

In every home port and on most foreign station there are opportunities for football, cricket, tennis golf, rowing, sailing, swimming, and all other sports On some foreign stations the Naval Officer can ge shooting and riding in plenty, and so cheap that h can indulge in them on his pay alone. In civil life a home only a rich man could get such magnificen shooting as the Naval Officer does is some parts of th world.

PAY AND ALLOWANCES.

Full Pay.

		£		£	
SURGEON LIEUTENANT (short service and permanent service)	from	444	to	487	per annum.
SURGEON LIEUTENANT - COMMANDER (promoted after six years' service)..	„	587	to	621	„
SURGEON COMMANDER (promoted after a further six years' service)..	„	754	to	958	„
SURGEON CAPTAIN (promoted by selection)	„	1092	to	1344	„
SURGEON REAR-ADMIRAL (promoted by selection)		1764			„
MEDICAL DIRECTOR-GENERAL (Surgeon Vice-Admiral) ..		2300			„

Allowances.

An outfit allowance of £50 towards cost of uniform is given.

Allowances when in charge of hospitals and sick-quarters ..	*10s. and 5s. per diem.*
Sixty Specialist allowances of ..	5*s.* per diem.
Allowances to Senior Medical Officers in flag ships ..	5*s.* and 2*s.* 6*d.* per diem.

Accelerated promotion can be gained under certain conditions provision allowance and lodging allowance are paid whe victualling and accommodation are not provided. Servant' allowance is also payable in certain appointments.

The extra allowances alluded to in this table are not to b looked upon as very exceptional. About a quarter of th Medical Officers of the Navy are drawing extra allowances.

The cost of living in the Navy is cheap, and a officer can live on his pay and enjoy life if he is no extravagant, especially if he does not embark i matrimony too early. A small amount of privat means goes much further in the Navy than in civi life. The three vital points—pay, prospects, an promotion—of the naval medical officer can be grasped by referring to the above clear and brief table.

PENSION.

Naval Officers retire at certain ages according to the rank they have attained. Except for those promoted to the 27 higher posts, the usual retiring age is 50 as Surgeon Commander, the appropriate pension according to scale being £552 per annum. With his experience in the Service, together with specialist qualifications, the Naval Medical Officer is able to obtain excellent openings on shore, being still at the age of 50 able to hold his own with his civilian confrères and being professionally at his best.

The scale of pensions is as follows:—

	Maximum retired pay.
SURGEON VICE-ADMIRAL ..	£1100 per annum, on vacating office.
SURGEON REAR-ADMIRAL ..	£929 per annum, at age of 60.
SURGEON CAPTAIN	£828 " " 55.
SURGEON COMMANDER	£552 " " 50.
SURGEON LIEUTENANT-COMMANDER AND SURGEON LIEUTENANT	£414 " " 45.

Officers permitted to withdraw receive gratuities on the following scale:—

	£
After 4 years' full pay permanent service ..	500
" 8 " " " " ..	1000
" 12 " " " " ..	1500
" 16 " " " " ..	2250

Of recent years Medical Officers have been *admitted* into the Navy without entrance examination, and for short service, with the option of turning over to the permanent service, but it is anticipated that it will not be long before the Admiralty will revert to the old established system of entrance by competitive examination twice a year, in batches of about ten officers.

The Medical Director-General of the Navy, Queen Anne's Chambers, Tothill-street, London, S.W.1, would be glad to receive inquiries from prospective candidates.

Dental Branch.

The Naval Dental Service offers similar opportunities to qualified dental surgeons except that higher rank than that of the recently instituted Surgeon Captain (D) is not open to them. They are provided with suitable surgery accommodation equipped with modern appliances and supplied with all material required for their work, and there is every opportunity for them to maintain a high standard of professional skill.

Candidates are required to produce certificates of birth, registration, and of character, and must be physically fit for active service anywhere. An outfit allowance of £50 is payable to officers finally entered and commissioned. The rank of Surgeon Lieutenant-Commander (D) is attained on the completion of six years' satisfactory service. Promotions to Surgeon Commander (D) and Surgeon Captain (D) are made strictly by selection from the rank next below and are confined to officers who prove fitted in every respect for these ranks. The present establishment of dental officers is: 1 Surgeon Captain (D), 3 Surgeon Commanders (D), 60 Surgeon Lieutenant-Commanders (D) and Surgeon Lieutenants (D).

Provision has been made for candidates who have held, or who, at the time of passing the examination hold or are about to hold, an appointment as Dental Officer in a recognised *Civil Hospital*. The time concerned, provided it does not exceed six months, may reckon for increase of full pay while on the active list.

On the completion of two years' service in the rank of Surgeon Lieutenant-Commander (D), dental officers on the Active List are eligible for a three months' post-graduate course at a dental hospital and school at the public expense, and will draw full pay while attending the course.

Pay.—The current rates of full pay for Dental Officers are as follows:—

	£ £
Surgeon Lieutenant (D)	368–453
Surgeon Lieutenant-Commander (D) (promoted after six years' service)	514–672
Surgeon Commander (D) (promoted by selection to fill vacancies in Establishment)	715–916
Surgeon Captain (D) (promoted by selection to fill vacancy in Establishment)	1049–1302

The Regulations regarding Pension and Withdrawal Gratuities are the same as for Medical Officers in the corresponding Ranks.

In 1919, when new rates of pay for all Naval Officers were fixed, it was decided that 20 per cent. of these rates should be considered as due to the then high cost of living. The rates of pay shown above are those payable on and after July 1st, 1931, and represent a reduction of approximately 8 per cent. owing to the decrease in the cost of living. The 20 per cent. above mentioned is to be regarded as variable and subject to change on July 1st, 1933, and thereafter as may be decided, either upwards or downwards according as the cost of living rises or falls.

ARMY MEDICAL SERVICE.

Royal Army Medical Corps.

SINCE the publication of the Royal Warrant of 1926 further improvements have been made in the conditions of service in the Royal Army Medical Corps, but the number of R.A.M.C. officers is some 20 per cent. below strength. This fact militates against the Service, by making the time spent abroad proportionately too long. The situation has interfered with recruiting.

The regulations for admission giving full details should be obtained from the Permanent Under Secretary of State (A.M.D. 1), War Office, Whitehall, London, S.W. 1, and carefully studied. A personal interview with a representative of the Director-General, Army Medical Services, is readily obtainable.

The rates of pay and allowances have been revised favourably, and should prove more attractive than they do, for the opportunities of post-graduate study are generous, and the work is varied, responsible, and interesting. The gratuities after certain periods of service enable an officer, should he so desire, to leave the Service with a capital sum large enough to go a long way towards re-establishing himself in civil life, and, further, the knowledge of the world and the comradeship of his fellow officers that he has gained in the Army will be of no small value to him.

New entrants are commissioned in the rank of Lieutenant, and the first six months of service are spent on probation, during which time they undergo, in addition to their Military training at the Royal Army Medical Corps Depôt at Aldershot, a probationary course at the Royal Army Medical College in London in Hygiene, Pathology, Tropical Medicine, Military Surgery, Recruiting, the prevention and treatment of Venereal Disease, and the elements of Army Administration. At the end of this course, and after qualifying at the necessary examinations, their commissions are confirmed, and they take their places in seniority according to the total marks obtained at all examinations up to that date. Officers Training Corps service with possession of Certificate "B" (Medical) carries a definite value in marks in this total.

An entrant who is holding or about to hold at the time of the entrance examination an approved whole-time Appointment at a recognised Civil Hospital may be seconded while holding such an appointment up to a maximum period of 12 months. A candidate who has held such an appointment within six months of entry may be granted an antedate up to 12 months in respect of the period the appointment was held. This secondment and antedate counts in all respects as commissioned service, except that pay will not be issued for that period. The Army Council are endeavouring to arrange for all officers who have not themselves obtained a civil hospital appointment to be given a house appointment in a civil hospital for six months, shortly after they receive their commissions.

After a total period of one year's service at home the young officer goes abroad, probably to India, for his first tour of foreign service. Here he gains his first practical experience of tropical disease and tropical hygiene, and possibly his first experience of active service on the frontiers of India. His tour abroad lasts five years, with probably six months' leave home during that time. On returning home the R.A.M.C. officer has the opportunity to decide whether he will remain in the Corps or accept the gratuity of £1000 after seven years' service, and try his fortune in civil life. If he elects to remain, he will, between his eighth and twelfth year of service, undergo a course of post-graduate study at the Royal Army Medical College and the London Hospitals of five months' duration, followed by a course of study of a special subject selected by himself, provided he has shown special aptitude in the post-graduate course or during his previous service. During this period of study he remains on full pay, and the fees for the courses are paid by the State. When qualified in his special subject, the officer becomes entitled to specialist pay at 5*s.* per day when holding a specialist appointment. After this post-graduate course the officer probably proceeds abroad again and promotion to Major rapidly ensues, and from that time onward the officer receives regular successive increases of pay, and is eligible for additional and charge pay as well. The Directorates of Hygiene and Pathology and the appointment of two serving officers as Consultants in Medicine and Surgery have been instituted and have proved a marked success, all these appointments being of the rank of Colonel or Major-General.

In addition to the grant of permanent commissions, the War Office offer a number of temporary commissions in the Royal Army Medical Corps, the holders of which may be invited at the end of 12 months' service, if suitable, and provided that vacancies exist, to accept permanent commissions in the Royal Army Medical Corps. If a permanent commission is accepted, the temporary service is allowed to count as the equivalent of permanent service for promotion, increase of pay, and retired pay. These conditions enable the young man to make acquaintance with army life, detriment to his ultimate prospects, before de whether to make a permanent career in the Army Medical Corps.

The possibilities for good workers are very There is scope for original research in tropical dis in preventive medicine, and in bacteriology, as as in the large clinical field open to the speci in Medicine, Surgery or Gynæcology, in Vene Disease, and in Ophthalmology. Child welfare is undertaken systematically by officers of the R Army Medical Corps.

At the same time instruction in administration continuous. The Royal Army Medical Corps essentially organised for war, and one of the lessons the Great War was that trained administrators mu exist to enable the fullest benefit to be obtained fr professional talent. Many appointments carryi administrative responsibility are open to those officers who display capacity for this duty. All officers must be prepared to undertake command and to have a knowledge of Army administration, especially in war. Equally important is the technical training of the Non-commissioned Officers and men of the Corps in such "trades" as Trained Nurse, Nursing Orderly, Masseur, Radiographer, Operating Room Assistant, Laboratory Assistant, Hospital Cook, Dispenser, &c. This training is carried out by the Officers and Nursing Sisters, and opens a large field for those who have ability in lecturing and teaching as well as the power of influencing men.

PAY AND ALLOWANCES.

Rank.	Pay.*	Rations †	Servant.	Married.			Unmarried.		Approximate tot per annum.	
				Lodging.	Fuel and Light.	Furniture.	Lodging.	Fuel and Light.	Married.	Un-marrie
	£ s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	£	£
Lieutenant	1 0 2	1 4	2 0	3 6	1 8	2 0	2 6	0 8	560	487
Captain	1 4 10	1 4	2 0	4 6	2 9	2 0	2 6	0 8	683	572
After 8 years' service ..	1 7 8	1 4	2 0	4 6	2 9	2 0	2 6	0 8	735	621
10 „ „ ..	1 9 10	1 4	2 0	4 6	2 9	2 0	2 6	0 8	774	663
Major	1 14 6	1 4	2 0	4 6	2 11	2 0	4 0	1 3	862	786
After 15 years' service ..	1 19 2	1 4	2 0	4 6	2 11	2 0	4 0	1 3	947	871
„ 18 „ „ ..	2 1 4	1 4	2 0	4 6	2 11	2 0	4 0	1 3	987	911
„ 20 „ „ ..	2 6 0	1 4	2 0	4 6	2 11	2 0	4 0	1 3	1072	996
Lieutenant-Colonel	2 12 10	1 4	2 0	4 6	3 0	2 0	4 6	2 5	1198	1151
After 3 years' service as such	2 17 6	1 4	2 0	4 6	3 0	2 0	4 6	2 5	1283	1236
Colonel	3 4 4	1 4	2 0	5 6	3 11	2 0	5 6	2 9	1444	1386
Major-General	4 7 4	1 4	4 0	11 0	5 0	2 0	11 0	3 11	2020	1963

* Pay Warrant rates less 8 per cent. from July 1st, 1931. The Pay Warrant rates are subject to revision to an extent no exceeding 20 per cent., according to variation in the cost of living. The next revision takes place from July 1st, 1933.

† Rates of Allowance vary from time to time and issues are subject to conditions laid down in Allowance Regulations.

PROMOTION.

Promotion takes place automatically to Captai after 3½ years, and to Major after 12 years' servic provided the officer is qualified and recommended f promotion. Promotion to the higher ranks is selection from those senior in the rank below, special promotion by brevet or otherwise is open officers of the Royal Army Medical Corps.

ADDITIONAL PAY AND CHARGE PAY FOR R.A.M.C. OFFICERS.

(1) Officer not above the rank of lieutenant-colonel, w acting as specialist in a post considered by the Army Cou to merit the grant of additional pay, according to subje or groups of subjects as under.

Operative Surgery, advanced; Medicine; Ophthalmolog Gynæcology and Midwifery; Dermatology and Venere Disease; Otology, Laryngology, and Rhinology; Radiology Anæsthetics; Mental Diseases; Hygiene; Pathology subjects other than above, at the discretion of Our Army Council, 4*s.* 7*d.* daily.

(2) (*a*) Officer in charge of a hospital.—If the number of equipped beds, as certified by the Deputy Director of Medical Services, exceeds—

50 beds ..	2*s.* 6*d* daily.	300 beds ..	7*s.* 6*d.* daily.
150 „ ..	5*s* 0*d.* „	600 „ ..	10*s.* 0*d.* „

Officer in charge of a medical or surgical division of a general hospital with not less than 300 beds—half the above rates.

	Daily. *s.*	*d.*
(*b*) Senior medical officer, Royal Arsenal, not exceeding	10	0
(*c*) Officer in command of the depôt, Royal Army Medical Corps	5	0
(*d*) The senior officer of the Army Medical Services with an army in the field: A rate to be fixed by the Army Council according to the magnitude of the charge.		
(*e*) The officer, if under the substantive rank of colonel, holding the appointment of senior medical officer in a command abroad, or of assistant director of medical services, if the number of soldiers is 1500 or upwards	5	0
(*f*) Adjutant R.A.M.C. Depôt	5	0
(*g*) Adjutant R.A.M.C. (Territorial Army)	2	6

RETIREMENT AND RETIRED PAY.

The following are the rates of retired pay:—

1. Retired pay will consist of two parts: (*a*) a service element based on the officer's total service; (*b*) a rank element for the rank from which the officer retires. An officer with less than 20 complete years' service will not be eligible to retire voluntarily on service retired pay.

2. The scale will be as follows, subject to the reduction of 8 per cent. referred to below:—

(*a*) Service element.—£15 a year for each completed year of service as a medical officer.

(*b*) Rank element.—

Rank from which retired.	After completing 1 year's service in the rank.	After completing each additional year's service.	Maximum rank element.
	£	£	£
Major	12	12	120
Lieutenant-Colonel	150	30	240
Colonel	290	50	390
Major-General ..	440	50	540
Lieutenant-General	590	50	690

The retired pay of an officer retiring with less than one complete year's service in the rank from which he retires will be assessed as though he had retired from the rank below.

Maximum rates of retired pay (*a*) and (*b*) together:—

	£		£
Captain and Subaltern ..	300	Colonel	800
Major	450	Major-General ..	1000
Lieutenant-Colonel ..	600	Lieutenant-General	1200

The above rates are those laid down in the Pay Warrant. They have been reduced by 8 per cent. as from July 1st, 1931, and are subject to future variation with fluctuation in the cost of living.

3. Officers with seven and less than 20 years' service as medical officers may be permitted to retire with a gratuity in accordance with the following scale:—

After 7 years' service as a medical officer ..	..	£1000
„ 15 „ „ „	..	£2800
„ 18 „ „ „	..	£3500

The Army Dental Corps.

This Corps is administered by the Director-General, Army Medical Services. Regulations for admission to the Army Dental Corps should be obtained from the Under Secretary of State, War Office, and carefully studied.

OFFICERS: APPOINTMENT AND PROMOTION.

Commissions as Lieutenants in the Army Dental Corps may be given to persons duly qualified under regulations approved by the Army Council.

An officer who is commissioned after holding an approved whole-time appointment in a recognised civil dental hospital or in the dental department of a recognised civil general hospital may be granted an antedate covering the period of his appointment, but not exceeding six months, provided that the interval between the termination of the hospital appointment and the date of entry into the Service does not ordinarily exceed six months. The period of such antedate will reckon towards promotion, increase of pay, gratuity or retired pay.

3. An officer is eligible for promotion to the rank of Captain on completion of three and a half years' service and to the rank of Major on completion of 12 years' service in the Corps, provided he has previously qualified in such manner as may be prescribed by the Army Council.

4. Promotion to the rank of Lieutenant-Colonel and Colonel to fill the establishments laid down from time to time for those ranks is made by selection from those senior in the rank below. Dental officers are also eligible for special promotion by brevet.

PAY.

The following are the rates of pay for officers of the Army Dental Corps.

These rates are 8 per cent. below those shown in the Pay Warrant, 1931. The latter are subject to revision to an extent not exceeding 20 per cent. according to variation in the cost of living. The next revision takes place on July 1st. 1933.

	Per diem. £	*s.*	*d.*
Lieutenant	0	18	4
Captain	1	3	0
Captain after 8 years' total service	1	5	10
Captain „ 10 „ „ „	1	7	8
Major	1	12	2
Major, after 15 years' total service	1	16	10
„ „ 18 „ „ „	1	19	2
„ „ 20 „ „ „	2	3	8
Lieutenant-Colonel	2	10	8
Lieutenant-Colonel after 3 years' service as such	2	15	2
Colonel	3	2	2

CHARGE PAY.

The officer in charge of the Dental Laboratories, Aldershot, receives charge pay at the rate of 5*s.* a day if holding the rank of Captain, or 2*s.* 6*d.* a day if holding the rank of Major.

ALLOWANCES.

The allowances for officers of the Army Dental Corps are at the same rates as for officers of the Royal Army Medical Corps.

RETIREMENT AND RETIRED PAY OR GRATUITY.

(1) The rates of retired pay will be the same as for officers of the Royal Army Medical Corps.

(2) Voluntary retirement on retired pay will not be allowed until after twenty years' service.

(3) Earlier retirement on gratuity may be allowed:—

After 8½ years'	service as a Dental Officer,	gratuity of £1000.
„ 15 „		„ £2000.
„ 18 „		„ £3000.

The aim of the Corps is the prevention of wastage on account of dental disease or dental deficiency, and, to enable this to be carried out, every recruit is inspected by a dental officer immediately after joining and all necessary treatment carried out. The soldier is reinspected at least once a year and the dental efficiency maintained at the best standard possible.

SWISS M.D. DEGREE FOR FOREIGNERS.—The Universities of Basle, Berne, and Zurich grant the degree of M.D. to medically qualified foreigners under the following conditions. Candidates are required to present an acceptable thesis and to pass a special final examination. Fee 400 Swiss francs (£10). Information on application to the dean of the medical faculty of each university. At Lausanne the doctorate in medicine can be obtained on the completion of one academic year of study (October-July) in the faculty of medicine followed by examination and the presentation of a thesis bearing on the year's study, the laboratory course being chosen in relation to the subject of the intended thesis. The candidate should make written application to the dean of the faculty of medicine, and further information can be obtained in this country from Dr. C. A. H. Franklin, (151, Sandgate-road, Folkestone, Kent), who is hon. secretary of the Lausanne Medical Graduates. The M.D. of Geneva is conferred under the same conditions as in Lausanne.

INDIAN MEDICAL SERVICE.

This service shares in the general conditions of change to which the whole of Indian State and civil affairs are at the present being subjected. While it is the view of many senior officers that the period of depression is passing, the grounds on which this view is held would be challenged by many. At the same time the India Office is inviting applications for permanent commissions on very favourable terms to young members of the medical profession. These terms include a gratuity of £1000 on retirement after six years' service, or one of £2500 after 12 years' service, together with free return passages for those who no longer desire to remain in the service. A frank announcement is made by the India Office, but the admission is made frankly that it is not possible to state at present what, if any, prospects of employment on the civil side will be open to I.M.S. officers under the proposed new constitution. We find it difficult to imagine the abolition of the civil side of the Service, having regard to past magnificent work and present urgent needs.

THE NEW REGULATIONS.

Competitive examination remains suspended for the present and admission to the Service is on written application to the India Office. As sound bodily health is a first essential candidates may, if they wish it, undergo a preliminary examination by a Medical Board which meets weekly at the India Office.

Candidates must be under 32 years of age at the time of application, and must possess a qualification registered in Great Britain and Northern Ireland, under the Medical Acts in force at the time of appointment. Arising out of the recommendations of the Lee Commission the Secretary of State for India in Council after consultation with the Government of India has decided that the Indian Medical Service constituted on the same broad lines as in the past shall be retained primarily to meet the needs of the Indian Army. In order to maintain the necessary minimum war reserve of military medical officers, and to provide for European medical attendance for European officers of the Superior Civil Services and their families, local governments will be required to employ a stated number of Indian Medical Service officers. The Government of India will draw on the same Service to meet the requirements of the civil administration for which they are responsible. For the present 237 such posts have been reserved, and including the leave reserve will provide employment for 302 officers. 212 of these officers will be British medical men and 90 Indians. As the proportion of European to Indian civil officers diminishes these figures will be subject to periodical scrutiny, and, if necessary, to revision. It will be a definite condition of service for all future entrants to the Service that they will be liable to serve on either the civil or the military side. All officers are required to perform one year's military duty subsequent to permanent appointment before they can be considered eligible for civil employment. Executive medical officers in both civil and military employment may attend persons unconnected with Government service provided their duty admits of it. On the military side, however, the opportunities for private practice are not great. Service during the war as a medical or combatant officer, or in a position usually filled by an officer, counts towards promotion and pension, and the commissions of officers who before appointment have obtained certain higher qualifications or have held resident appointments in certain hospitals may be antedated by one year.

RATES OF PAY.

The monthly rates of pay for European officers of non-Asiatic domicile in the Service are as tabulated below. The rupee, it may be remembered, has now been definitely stabilised at 1*s.* 6*d.*

Rank and service in rank.	Basic pay.	Overseas pay.	Year of total service.
	Rs.	Rs.	
Lieut.	500	150	First
		150	Second
		150	Third
Captain :—			
1. During first three years' service as Captain.	650	150	Fourth
		£15	Fifth
		£15	Sixth
2. With more than three and less than six years' service as Captain.	750	£25	Seventh
		£25	Eighth
		£25	Ninth
3. With more than six years' service as Captain.	850	£25	Tenth
		£25	Eleventh
		£30	Twelfth
Major :—			
1. During first three years' service as Major	950	£30	Thirteenth and over.
2. With more than three and less than six years' service as Major	1100		
3. With more than six years' service as Major	1250		
Lieut.-Colonel :—			
1. Until completion of 23 years' total service	1500		
2. During twenty-fourth and twenty-fifth years' total service	1600		
3. After completion of 25 years' total service	1700		
4. When selected for increased pay ..	1850		

Note.—Until the completion of 23 years' total service basic pay is regulated according to rank and service in rank (column 1) which, owing to the system of accelerated promotion, may be in advance of the time-scale of promotion. Overseas pay is regulated solely with reference to length of total service (column 4). In addition to the above rates various allowances are admissible for a large number of special appointments on both the military and the civil side which may be held by members of the I.M.S. Special high rates of pay are also attached to the numerous administrative appointments open to officers in both branches of the Service. The appointment of Director-General, I.M.S., which is held by an I.M.S. officer, carries pay of Rs.3500 per mensem. The appointment of Director of Medical Services in India, carrying pay at Rs.3200 per mensem, may also be held by an officer of the Indian Medical Service.

Initial rates of pay are based on the assumption that the majority of newly appointed officers will be bachelors. Officers on arrival in India will be posted for one year to specially selected stations. Officers in military employment, when in command or second-in-command of the larger station hospitals receive special allowances. On the civil side there are public health, bacteriological, research, and professorial appointments carrying special enhanced rates. Officers on appointment receive an outfit allowance of £50.

PENSIONS AND ALLOWANCES.

The rates of pensions are as shown in the table below.

Service.	Rates per annum.	Service.	Rates per annum.
After 17 years ..	£400	After 23 years ..	£620
„ 18 „ ..	430	„ 24 „ ..	660
„ 19 „ ..	460	„ 25 „ ..	700
„ 20 „ ..	500	„ 26 „ ..	750
„ 21 „ ..	540	„ 27 „ ..	800
„ 22 „ ..	580		

Note.—The above rates are subject to periodical revision upwards or downwards, to an extent not exceeding 20 per cent. in all, on account of a rise or fall in the cost of living as compared with the year 1919. A deduction of 6 per cent on this account has already been made. Nevertheless the full pension of a lieutenant-colonel cannot be cut below the maximum of £700 under the old rules in the case of officers who entered the service before July 1st, 1920.

There are additional pensions not subject to the above reduction ranging from £65 to £350 per annum for officers who have held high administrative appointments as colonels or major-generals.

Officers on appointment are provided with free passage to India, normally by transport. The wives and families of officers who are married prior to the date of the officers' embarkation on first appointment will also be given free passage to India subject to the payment of messing charges. Officers are granted a certain number of return passages home at Government expense during their career. There are special allowances for officers whilst on study leave.

Further particulars can be obtained on application to the Secretary, Military Department, India Office, Whitehall, London, S.W. 1. Letters should be marked "Recruitment for I.M.S."

AIR FORCE MEDICAL SERVICE.

THE Air Council attach great importance to attracting into the service the best type of medical man, since on the capacity of the Medical Service depends in a peculiar degree the safety and efficiency of the Air Force. The duties of a medical officer in the Air Force include not only the prevention and treatment of those ordinary diseases to which the personnel of any fighting service are liable, but the special study of the mental and physical stresses imposed on the airman in diverse circumstances and climates—a new branch of medicine which still provides considerable scope for research.

As promotion to the higher ranks of the Service is by selection from officers who are eligible by reason of length of service, and as a certain proportion of the higher ranks will be reserved for purely professional as opposed to administrative appointments, it will be seen that there are excellent prospects for the young medical officer who exhibits ability and energy in his professional work.

The work to be done, therefore, has a high professional interest which, combined with good rates of pay and allowances, offers a career for medical men which should prove both attractive and interesting. The life is one which is certain to appeal to the man of wide outlook who desires opportunities for travel, sport, and games, and can find interest and enjoyment in aviation.

His duties will, as a matter of course, give him flying experience as a passenger, which is necessary for the proper study of the medical problems of aviation and for gaining first-hand knowledge of the conditions under which his comrades serve.

The establishment will consist partly of permanent and partly of short-service officers.

An officer will on first entry be granted a short-service commission for a period of three years on the active list (which may be extended to five years at the discretion of the Air Council if the officer so wishes on the recommendation of the Director of Medical Services) and of four years in the Reserve of Air Force Officers. Selections for permanent commissions will be made from officers holding short-service commissions, and those who are not selected will be transferred to the Reserve at the expiration of their period of service on the active list.

For those entrants who desire it the prospect of obtaining a permanent commission is approximately an even one. Experience has so far shown that the officers selected have included the great majority of those desirous of, and suitable for, retention in the service; owing to the fact that the short-service commission with its gratuity after three or five years is in itself an attraction to many entrants who desire to enlarge their experience and outlook from the point of view of subsequently entering private practice, or who, on entry, have not made up their minds to the adoption of a permanent career in the service and subsequently find that they would prefer to return to civil life.

For certain purposes medical officers may be allowed to count as service their time spent in approved whole-time appointments in civil hospitals under certain well-defined and generous conditions.

Officers who have been selected for permanent commissions may be permitted to attend for a period not exceeding nine months a post-graduate course in general medicine and surgery, tropical and preventive medicine, and other special subjects. Such permission may be granted at any time when the exigencies of the service permit during the first 16 years of service, and when attending these courses officers will receive full pay and allowances.

New entrants into the Royal Air Force Medical Service will be commissioned as Flying Officers (Medical) and will be eligible for promotion to the rank of Flight Lieutenant (Medical) after two years' service. Officers selected for permanent commissions will normally be promoted to the rank of Squadron Leader after ten years' total service. Accelerated promotion may be granted in a limited number of cases to officers who show exceptional ability after

ROYAL AIR FORCE MEDICAL BRANCH: RATES OF PAY AND ALLOWANCES.

Rank.	Pay.*			Cash allowances at home rates in lieu of quarters, rations, and servant, if not available in kind (per annum).†		Pay plus allowances per annum.	
	Daily rates.		Per annum (current rate) (from 1/7/1931.				
	Standard.	Current.		Married.	Unmarried.	Married.	Unmarried.
	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.
Flying Officer	1 4 0	1 2 0	401 10 0	191 12 6	118 12 6	593 2 6	520 2 6
Flight Lieutenant— ..	1 6 0	1 4 0	438 0 0	229 12 11	118 12 6	667 12 11	556 12 6
After 2 years as such..	1 8 0	1 5 10	471 9 2	229 12 11	118 12 6	701 2 1	590 1 8
After 4 years as such..	1 10 0	1 7 8	504 18 4	229 12 11	118 12 6	734 11 3	623 10 10
Squadron Leader— ..	1 14 0	1 11 4	571 16 8	232 13 9	156 12 11	804 10 5	728 9 7
After 2 years as such..	1 18 0	1 15 0	638 15 0	232 13 9	156 12 11	871 8 9	795 7 11
After 4 years as such..	2 0 0	1 16 10	672 4 2	232 13 9	156 12 11	904 17 11	828 17 1
After 6 years as such..	2 4 0	2 0 6	739 2 6	232 13 9	156 12 11	971 16 3	895 15 5
After 8 years as such..	2 8 0	2 4 2	806 0 10	232 13 9	156 12 11	1038 14 7	962 13 9
After 10 years as such..	2 10 0	2 6 0	839 10 0	232 13 9	156 12 11	1072 3 9	996 2 11
Wing Commander— ..	2 15 0	2 10 8	924 13 4	234 4 2	187 1 3	1158 17 6	1111 14 7
After 2 years as such..	2 17 0	2 12 6	958 2 6	234 4 2	187 1 3	1192 6 8	1145 3 9
After 4 years as such..	3 3 0	2 18 0	1058 10 0	234 4 2	187 1 3	1292 14 2	1245 11 3
Group Captain	3 10 0	3 4 4	1174 1 8	305 13 9	247 17 11	1479 15 5	1421 19 7
Air Commodore	4 0 0	3 13 8	1344 8 4	361 19 2	308 14 7	1706 7 6	1653 2 11
Air Vice-Marshal.. ..	5 0 0	4 12 0	1679 0 0	425 16 8	369 11 3	2104 16 8	2048 11 3

* Except for periods of service under Indian administration. For such periods officers receive pay and allowances at rates and subject to conditions authorised from time to time by the Government of India.

† These allowances are issued only when accommodation, fuel and light, rations, and personal attendance are not available in kind. Normally, provision in kind is available for junior officers. "Married" rates of allowances are payable only to married officers who have reached the age of 30 or the rank of Squadron Leader. Rates of allowances abroad are fixed in relation to costs in the particular country, and a colonial allowance is granted in certain commands abroad. The rates and general scheme of allowances are liable to revision as circumstances may require.

the completion of eight years' service. Promotion within establishment to the rank of Wing Commander will be by selection at any period after 16 years' total service, and to that of Group Captain by selection at any period after 22 years' service.

Certain posts in these ranks are reserved for officers fully employed in professional work, such as surgery, pathology, ophthalmology, &c., numbering at present six in all. The number of these posts will be limited only by the needs of the service and by the necessity of observing a similar proportion between the number of reserved posts and the officers from whom they can be filled, as exists between the total number of higher ranks and the remainder of the medical service. Selections for these reserved posts will be made only from officers professionally qualified to hold them. Officers filling the reserved posts will be eligible for selection to the administrative appointments of their rank, and to the highest administrative appointments.

There will be no competitive examination on entry; candidates must be under 28 years of age, be British subjects, the sons of British subjects, and of pure European descent, be nominated by the dean of a recognised medical school or teaching hospital, and will be interviewed personally by the Director of Medical Services, Royal Air Force, before acceptance. Each candidate must produce :—

1. Birth certificate. 2. Medical registration certificate. 3. A declaration containing the following information: (*a*) Age and place of birth. (*b*) That he is a British subject, the son of British subjects, and of pure European descent. (*c*) That he is ready to engage for general service at home or abroad as required. (*d*) The qualifications he is possessed of, and what medical or other appointments he has held (if any). (*e*) That he is willing to fly as a passenger whenever called upon to do so.

Each candidate will be required, before acceptance, to pass a medical examination to ensure that he labours under no constitutional or mental disease or diseases or weakness, nor any imperfection or disability which may interfere with the efficient discharge of the duties of a medical officer in any climate, in peace or war.

On appointment entrants will undergo an initial course of eight weeks, during which they will be given instruction in the special medical aspects of aviation, the organisation and administration of the Royal Air Force, and the general and special duties to be performed by officers in the Medical Branch.

In order to avoid the necessity for further examinations the position of entrants in order of seniority in the Air Force List will be determined at the end of the initial course by a system of marking and reports on the actual work done during their instruction.

UNIFORM AND EQUIPMENT.

Medical officers are required to provide themselves with the uniform, service dress and mess dress of their rank and with the distinguishing badges of the Royal Air Force Medical Branch. The provision of full dress is entirely optional at present. An allowance of £50 towards the cost of uniform is made on joining to candidates who have not had previous commissioned service in H.M. Forces.

EMOLUMENTS.

The emoluments of medical officers of the Royal Air Force are given in outline above. The rates of pay are fixed on an inclusive basis, and the fact that specialist pay and charge pay are not payable as separate emoluments was taken into account when the rates were fixed. The standard rates of pay and retired pay were drawn up on the basis of the high cost of living in 1919, and 20 per cent. of each of the standard rates is detachable and subject to alteration upwards or downwards in relation to the increase or decrease of the cost of living above or below the cost in July, 1919. Under this provision the current rates in force from July 1st, 1931, represent a reduction of approximately 8 per cent. on the standard rates. The next revision will take effect from July 1st, 1933.

Retired Pay.

The minimum period of service qualifying for retirement on retired pay is 20 years. Standard rates of retired pay are as follows :—

AIR OFFICERS.

Air Vice-Marshal ..	.. £790 to £1010 per annum.
Air Commodore ..	.. £650 „ £950 „ „

The maximum standard rates of retired pay and the compulsory retiring ages for the several ranks are :—

Rank.	Yearly rate of retired pay.	Compulsory retiring age.
	£	
Air Vice-Marshal ..	1010	60
Air Commodore ..	950	57
Group Captain.. ..	900	55
Wing Commander ..	600	51
Squadron Leader ..	500	48

OFFICERS BELOW AIR RANK.

Age on retirement.	Standard yearly rate of retired pay.	Years of service.	Addition for each extra year of service.*	Deduction for each deficient year of service.*
	£		£	£
40	300	17	15	15
41	337	17	15	15
42	375	18	15	15
43	412	18	15	15
44	450	19	15	15
45	487	19	15	15
46	525	20	15	15
47	562	20	15	15
48	600	21	15	15
49	637	21	15	15
50	675	22	15	15
51	697	22	22	15
52	720	23	22	15
53	742	23	22	15
54	765	24	22	15
55	790	24	22	15

* Limited to five years.

Gratuities.—A permanent officer allowed to retire before having qualified for retired pay may be granted a gratuity provided he has not less than ten years' commissioned service, namely :—

£1500 if he has 10 but less than 15 years' commissioned service.
£2500 „ „ 15 or more than 15 „ „ „

Short-service officers will be eligible on passing to the Reserve for gratuities on the following scale: £100 for each of the first two complete years of service, £150 for each of the third and fourth complete years, and £200 for the fifth complete year; that is :—

For three years' service on the active list ..	£350
For five „ „ „ „ „ ..	£700

These gratuities will not be payable to officers granted permanent commissions, but their service on a short-service commission will count towards retired pay.

FELLOWSHIP OF MEDICINE AND POST-GRADUATE MEDICAL ASSOCIATION.—The list for the immediate special courses includes one week's course in chest diseases, from Sept. 7th to 12th, a two weeks' course in general medicine and surgery, from Sept. 14th to 26th, at the Westminster Hospital; diseases of infants, at the Infants Hospital, from Sept. 14th to to 26th; ophthalmology, at the Central London Ophthalmic Hospital, from Sept. 14th to Oct. 10th; general medicine and surgery, at the Metropolitan Hospital, from Sept. 28th to Oct. 10th; and psychological medicine, from Sept. 8th to Oct. 10th, at the Bethlem Royal Hospital.

COLONIAL MEDICAL SERVICE.

THE various Colonial government medical departments employ some 1200 European medical officers and about the same number of qualified Asiatic and African medical officers who are appointed locally. Included in this total are about 60 qualified European women medical officers. About 850 trained nursing sisters and health visitors are employed, most of whom are Europeans. There are large numbers of subordinate personnel, sanitary inspectors, medical assistants, and dressers, most of whom are natives of the areas in which they serve.

Throughout nearly the whole of the Colonial Empire such diseases as malaria, yaws, leprosy, and hookworm disease menace the health of the indigenous people and retard the progress of development. In equatorial Africa sleeping sickness and plague persist, in West Africa yellow fever has not yet been eradicated, and in the Near and Far East outbreaks of cholera and plague occur from time to time. But in addition to tropical diseases, those maladies usually met with in this country are prevalent throughout the Empire.

An officer in the Colonial Medical Service thus has unique opportunities for the practice of his profession. On joining his medical department his duties include medical, surgical, and public health work. He may be posted to an outlying or bush station where he will be responsible for all the medical activities in connexion therewith; or he may be attached for duty at one of the large hospitals. Every encouragement will be given him to pursue any specialist work in which he may be interested in so far as the exigencies of the service permit. Great importance is attached to a candidate's post-graduate experience, as in the outlying districts he will frequently be called on to deal with emergencies without being able to seek the advice and assistance of his colleagues.

VACANCIES.

Vacancies for medical officers may occur at any time of the year, and are dealt with as circumstances require. The almost complete cessation of recruitment during the war period, coupled with the post-war expansion of staffs, particularly in the larger Colonies, resulted in an abnormally high rate of recruitment. The average for the six years, 1924 to 1929, was 104 vacancies per annum. In 1930 the number of vacancies fell to 77, due to the establishments of medical departments being almost at full strength. It is expected that normally some 50 vacancies will be declared annually as the result of wastage through retirement, without allowing for any abnormal increases of staff. Vacancies occur most regularly and frequently in Tropical Africa and Malaya. The vacancies for which candidates are selected from outside the service are those for ordinary medical officers. Appointments for specialists are almost invariably reserved for officers who are already in the service, and who have shown outstanding merit in a particular branch of medicine or surgery. About six vacancies may be expected annually, usually in West Africa and in Malaya, for women medical officers.

QUALIFICATIONS.

Applicants must be under 35 years of age, and preference is given to candidates under 30. For certain appointments candidates must be of European parentage.

Preference will be given to applicants who have held hospital or public health appointments or who have special knowledge of anæsthetics, radiology, surgery, medicine, ophthalmology, gynæcology and midwifery, diseases of the ear, nose, and throat, or venereal diseases. In the case of women medical officers experience in maternity and child welfare is almost essential.

Every selected candidate will be required to undergo a course of instruction at the London School of Hygiene and Tropical Medicine or at the Liverpool School of Tropical Medicine or at Edinburgh University, before taking up his appointment. The cost of tuition will be paid by the Government, but candidates must make their own arrangements for board and lodging. An allowance of £25 a month will be paid to them monthly in arrear while they are under instruction. Candidates who are successful in obtaining the diploma in tropical medicine and hygiene of London, Liverpool, or Edinburgh are granted a refund of their examination fees. If an officer has not taken a course of instruction in tropical medicine prior to appointment, he is usually required to take one during his first leave of absence and to obtain a satisfactory certificate before he can be confirmed in his appointment.

GENERAL CONDITIONS OF SERVICE.

The actual value of an appointment is often much greater than is indicated by the salary alone. An applicant should take into consideration whether the post is pensionable; whether free quarters are provided; whether any special local allowances are payable; whether free passages are provided on first appointment and when proceeding on leave; and whether free or assisted passages are provided for the wives and children of married officers. If local income tax exists in a colony it is much lower than that payable at home.

While each dependency has its own establishment, the higher posts are normally filled by selection from the Colonial Service generally, any member of which is eligible for vacancies in dependencies other than the one in which he is serving. But transfers from one colony to another are unusual during the early years of an officer's career.

The majority of appointments are pensionable. Officers appointed to pensionable posts serve on probation in the first instance, the probationary period varying in different services—e.g., two years in East Africa, three years in West Africa. Some appointments are temporary, and service in these does not qualify for pension unless the appointment is subsequently made pensionable.

Information as to the conditions and cost of living in the colonies, protectorates, and mandated territories is contained in a publication of that title (Colonial No. 56), which may be obtained from H.M. Stationery Office, price 3s. Further information as to the staffs, the climate, and local conditions will be found in Appendix III. of the Dominions Office and Colonial Office List, which also contains the rules as to leave of absence, free passages, &c. Leaflets concerning nearly all the tropical dependencies are issued for the use of intending settlers and others by the Oversea Settlement Department, Dominions Office, Caxton House, Tothill-street, London, S.W.1. A new memorandum on Medical Appointments just issued by the Colonial Office will be sent without charge on application to the Director of Recruitment.

Applications for medical appointments in the Colonial Service should be addressed to the Director of Recruitment (Colonial Service), Colonial Office, 2, Richmond-terrace, Whitehall, London, S.W.1. For the present no candidate will be considered by the Secretary of State for the Colonies who did not —if of suitable age—serve in some branch of His Majesty's Forces during the Great War, unless his reasons for not having done so are considered entirely satisfactory by the Secretary of State.

APPOINTMENTS FILLED BY THE SECRETARY OF STATE FOR THE COLONIES.

The medical appointments at the disposal of the Secretary of State for the Colonies are confined to those colonies, protectorates, and dependencies which are administered under his directions. They are here classified under the headings (*a*) Tropical Africa, (*b*) Eastern Colonies and Protectorates, (*c*) West Indian Colonies, (*d*) Western Pacific, (*e*) Mediterranean

Colonies, (*f*) an Island Group, (*g*) Middle East. In Ceylon, Mauritius, Jamaica, Barbados, the Bahamas, and Bermuda vacancies are practically always filled locally by the appointment of qualified candidates, or in the case of some of the higher posts, by transfer from other colonies. Appointments in Malta are all filled locally. Each colony or protectorate has its own separate medical establishment, but there are grouped services in East and West Africa and in Malaya. Although individual wishes are consulted, officers are liable to be posted or transferred to any of the dependencies within such a grouped service.

Tropical Africa.

EAST AFRICAN MEDICAL SERVICE.

The medical staffs of Kenya, Uganda, Nyasaland, Somaliland, Zanzibar, and the Tanganyika Territory form one service (Northern Rhodesia has its separate establishment), the members of which are liable to be posted or transferred to any of the Dependencies as the exigencies of the service may require. The preferences of individual officers are, however, taken into consideration as far as possible. Selected candidates are appointed as medical officers on probation in the first instance for two years, at the end of which period their appointments are made permanent if their service has been satisfactory, and a native language test has been passed. Later on a special course of study must be taken while on leave. Candidates can generally take their wives with them on first appointment. Medical officers (but not health officers) are permitted to take private practice at some stations on the understanding that they give precedence to their official duties. It must be understood that additions to their income from this source are not likely to be substantial, and that the privilege is liable to withdrawal at any time.

Officers are provided with quarters free of rent or the Government may provide temporary accommodation, or an allowance in lieu of quarters may be paid. The salary of a medical or sanitation officer is £600 per annum, rising by annual increments of £30 to £840, and thence by increments of £40 to £920, subject to an efficiency bar at £840. Senior medical officers and senior sanitation officers are paid on the scale £1000 by annual increments of £50 to £1100. Officers who possess the Diploma in Public Health on entering, or who acquire it while in the Service, receive two special increments in the scale.

Officers of the East African Medical Service are permitted to retire with gratuity, if they wish, instead of waiting to retire on pension as follows: (*a*) After nine years' service, of which at least six must have been spent in East Africa, £1000; (*b*) after 12 years' service, of which at least eight must have been spent in East Africa, £1250. If an officer elects to retire with gratuity he thereby forgoes all claim to pension.

The highest grades and salaries in the medical departments are as follows:—

Kenya.—Director of Medical and Sanitary Services, £1500; Deputy Director of Medical Service, £1200; Deputy Director of Sanitary Service, £1200; Deputy Director of Laboratory Service, £1200; Resident Surgical Officer, £1200.

Uganda.—As Kenya.

Tanganyika Territory.—As Kenya.

Nyasaland.—Director, £1300; Medical Entomologist, £1000–£50–£1100.

Zanzibar.—Director, £1400; Deputy Director of Sanitary Service, £1200; Resident Surgical Officer, £1000–£50–£1100.

Somaliland.—Principal Medical Officer, £1000–£50–£1100.

Northern Rhodesia.—Director, £1300; Deputy Director of Sanitary Services, £1200.

There are also the following posts:—resident surgical officers (Kenya and Uganda), £1200; medical superintendent and principal of medical school, Mulago Hospital (Uganda), £1150; sleeping sickness officer (Tanganyika Territory), £1000–£50–£1100; senior bacteriologists (Kenya and Uganda), £1000–£50–£1100. Health officers are selected from the ranks of medical officers as occasion arises.

Leave and Passages.—The normal tour of service is 20 to 30 months (less in Somaliland), after which leave is granted with full salary to an amount of six days for each completed month of residence (or three days when for any reason the officer is not returning to East Africa), exclusive of the periods of the voyages to and fro. Extensions of leave with full salary are given in case of sickness or in the case of officers attending approved courses of instruction. In addition to the above, local leave may be granted up to 14 days a year. Officers serving in Northern Rhodesia are allowed four (or two) days' leave in respect of each month of service.

Free first-class passages are provided for the officer on first appointment and on leave, and in certain cases assistance towards family passages is given.

Pensions.—Officers on the pensionable establishment may retire (or be retired by the Government) on attaining the age of 50 years; but they may be retained in the service, with their own consent, for such further period as the Government may recommend. Earlier retirement in the event of ill-health is also provided for. Pension is computed at one-four hundred and eightieth of pensionable emoluments—i.e., salary and value of free quarters in respect of each month's pensionable service—at the time of retirement, subject to an average of emoluments for the last three years before retirement. For instance, an officer of 25 years' service who has reached the maximum of the long scale receives a pension of about £650.

WEST AFRICAN MEDICAL STAFF.

This service consists of the qualified European male personnel of the medical department of the Gambia, Sierra Leone, the Gold Coast (including Ashanti, the Northern Territories, and British Togoland), and Nigeria (Southern and Northern Provinces, and the British Cameroons).

Officers hold their appointments in the first instance on probation for three years from the date of their first arrival. After passing a language test and being placed on the permanent establishment this period is counted for pension. Officers are not allowed to take their wives and young children out with them without the sanction of the Governor. When, as is usually the case, an officer has obtained permission to be accompanied by his wife a grant of one-half the cost of his wife's passage to and from West Africa is made subject to certain conditions.

Candidates may express a preference for any particular Colony, and their wishes in this respect will be borne in mind and met as far as possible, but they are liable to be posted in the first instance, or transferred afterwards if necessary to any other West African Colony at the discretion of the Secretary of State. Transfers from one Colony to another are made as seldom as possible, and those transferred do not forfeit their claim to pension.

Leave.—European officers in West Africa may be granted vacation leave on full salary not exceeding in all one week's leave in the United Kingdom for every completed calendar month of total residential service in West Africa, plus the time necessarily taken on the journey to the United Kingdom, and, if the officer is returning to West Africa for further service, the time necessarily taken on the journey from the United Kingdom to the Colony. Vacation leave may be granted without any special grounds after 18 consecutive calendar months of residential service in West Africa. An officer will not be required to serve a tour of more than 24 consecutive calendar months' residential service except in special circumstances; and the Governor may grant vacation leave to any officer at any time after he has completed 12 consecutive calendar months' residential service. Within the above limits, the actual length of each officer's tour will be at the discretion of the Governor. Vacation leave on full salary may also be granted to an officer if he is invalided from West Africa after less than 12 consecutive calendar months' residential service, and sick leave on full salary may be granted for any period not exceeding six calendar months. In addition, local leave may be granted up to 27 days in any one tour.

Appointments and Salaries.—Medical officers for the West African colonies and protectorates are on one list for employment and promotion. The grades and emoluments of the staff in Nigeria are at present as follows:—

Appointment.	Salary.	Remarks.
1 Director of Medical and Sanitary Service.	£1800	Duty allowance £360.
1 Deputy Director, Medical Service.	£1500	Duty allowance £300.
1 Deputy Director, Health Service.		
2 Assistant Directors of Medical and Health Service.	£1400	Duty allowance £280.
3 Specialist Officers	£1300	Duty allowance £260. After five years' approved service the Deputy Director is eligible for a salary of £1400 with duty allowance £280.
1 Deputy Director, Laboratory Service.		
4 Assistant Directors of Medical Service.	£1300	Duty allowance £260.
1 Assistant Director of Health Service.		
1 Director, Tsetse Investigation.	£1200	Staff pay £300.
5 Senior Health Officers	£1050–£50–£1200	Duty allowance £210.
11 Senior Medical Officers	£1000–£50–£1150	Seniority allowance £100.
1 Deputy Director, Tsetse Investigation.	£800–£40–£960	Staff pay £150; Seniority allowance £72.
1 Senior Sleeping Sickness Officer.		
1 Alienist Officer		
1 Research Medical Officer		
1 Superintendent, Dispensers' Training School.		
11 Pathologists	£660–£30–£720–£40–£960	—
13 Medical Officers of Health.		
97 Medical Officers		
3 Lady Medical Officers		

The highest grades and salaries in the other medical departments are as follows:—

The Gambia.—Senior Medical Officer, £1000–£50–£1150.

Sierra Leone.—Director, £1400; Surgical Specialist, £1300; Deputy Director of Health Service, £1300.

The Gold Coast.—Director, £1600; Deputy Director of Medical and Sanitary Service, £1400; Deputy Director of Health Service, £1400; Deputy Director of Laboratory Service, £1300; three Specialist Officers (two surgical, one medical), £1300; two Assistant Directors of Medical Service, £1300; Assistant Director of Health Service, £1300.

The number of specialist appointments is not fixed, officers of outstanding professional merit being eligible for them. There are 20 appointments of the grade of senior medical officer, and eight of senior health officer. Possession of the diploma in public health is usually required for appointment to this grade. Special facilities are granted to study for the diploma during leave. There are at present 29 appointments as medical officer of health. The salary scale is the same as that of medical officers, except that medical officers of health are granted an initial salary at the rate of £800 a year, together with seniority allowance at the rate of £72 a year and staff pay at the rate of £150 a year, half of which is payable during leave. After three years' service on the maximum of the scale, viz., £960 a year, and on undergoing an approved course of study, medical officers of health are eligible, if unpromoted, subject to the recommendation of the Governor, to be placed on the scale £1000 a year rising by annual increments of £50 to £1150 a year, together with seniority allowance at the rate of £100 a year and staff pay as before. The holders of these appointments are not allowed private practice. Candidates must obtain a diploma in tropical medicine and hygiene, or be in possession of a diploma in public health. They are appointed subject to the condition that, if after a period they are considered unsuitable to serve in that capacity, they may be called upon to transfer to the medical side. The salary of medical officer is at the rate of £660 a year, rising by annual increments of £30 to £720 a year. Then, if confirmed in the appointment, £720 a year, rising by annual increments of £40 to £960, with seniority allowance at the rate of £72 a year. Before passing £800, medical officers are required to take a special course of study for three months. If they obtain satisfactory certificates at the end of the course they draw their further increments up to £960 a year. A medical officer who has served for three years on the maximum salary of this scale (£960) without obtaining promotion is eligible, if recommended by the Governor, to be placed on the scale £1000–£50–£1150, with £100 seniority allowance (as for senior medical officers).

Research and Pathology.—The director of the Medical Research Institute, Lagos, and the director of the Medical Research Institute, Accra, receive a salary of £1300 a year, with a duty allowance of £260 a year, rising after five years' approved service to a salary at the rate of £1400 a year and duty allowance at the rate of £280 a year. There are a number of appointments for pathologists and bacteriologists in Nigeria, the Gold Coast, and Sierra Leone. The salary and other conditions attached to these posts are similar to those of medical officers of health.

All officers of the staff, except directors, deputy directors, assistant directors, senior sanitary officers, medical officers of health, research officers, and a few other officers holding special appointments, are at present allowed to take private practice, provided that it does not interfere with the faithful and efficient performance of their official duties, but it is within the power of the Governor to withdraw or suspend the privilege in such places and for such periods as he may consider desirable. Private practice does not exist at many stations, and no guarantee can be given that an officer will be posted to a station in which he will be able to practise privately. As a general rule, and subject to the exigencies of the service, stations where there is private practice are allocated to senior members of the Staff.

African Medical Officers.—In addition to the membership of the West African Medical Staff, which is limited to British subjects of European parentage, there are a number of Government appointments for African medical officers in the West African Colonies. These appointments carry a salary on the scale £500–£20–£600, and there is a higher scale, £600–£30–£720. In addition, in Nigeria and on the Gold Coast, arrangements have been made for the employment of a few young African medical men temporarily on the hospital staffs, with a view to appointment to the Government service later, if suitable. In such cases a salary of £400 a year is paid.

Eastern Colonies and Protectorates.

MALAYAN MEDICAL SERVICE.

The qualified European personnel of the medical departments of the Straits Settlements, the Federated Malay States (Perak, Selangor, Negri Sembilan, and Pahang), the Unfederated Malay States (Johore, Kedah, Perlis, Kelantan, Trengganu, and Brunei) form one service. Officers are liable to be posted or transferred to any of the territories, though they are generally posted in the first instance to the Straits Settlements or the Federated Malay States.

Medical officers are appointed on the following scale of salaries: £700, rising to £770 during three years' probation; then, if they are placed on the pensionable establishment, rising to £805, and thence by annual increments of £35 to £1120, with a strict efficiency bar at £840. Officers possessing the D.P.H. receive an additional allowance (non-pensionable) of £140.

Above the concluding figure of £1120 there are certain higher appointments, as follows: principal civil medical officer, Straits Settlements, and principal medical officer, Federated Malay States, £1680 each; director, Institute for Medical Research, Federated Malay States, chief health officer, Federated Malay States, and principal, King Edward VII. College of Medicine, Singapore, £1540 each; 12 posts at £1470; and 31 posts at £1190, rising annually by £42 to £1400. Salaries are paid in dollars at 2*s.* 4*d.*

Temporary allowances are at present paid to all Government officers in the Straits Settlements and Federated Malay States: unmarried, 5 per cent. of salary; married, 10 per cent. Private practice by Government medical officers is not allowed, but consultation work with another practitioner is permitted. Information about general conditions in Malaya is obtainable from the Malayan Information Agency, 57, Charing Cross, London, S.W. 1.

Leave.—Eight months' full-pay leave is normally granted: (*a*) after a tour of four years' resident service during the first eight years of resident service; (*b*) after a tour of three years' resident service during the next six years of resident service; (*c*) after a tour of two and a half years' resident service after 14 years' resident service. Additional leave on half-pay may be granted on special grounds. Officers are provided with free passages on first appointment for themselves and their families (i.e., wife and children) up to five persons, inclusive of the officer. On completion of each full tour, free return passages are given to all officers (with wife and children under the age of 10).

HONG-KONG.

Officers are appointed on probation for three years. A diploma of public health is required for a health officer. The present establishment of the medical department is: director of medical and sanitary services, £1500–£50–£1800; deputy director £1300–£50–£1400; senior medical officer and senior health officer, £1200–£40–£1280; malariologist, health officer of port, bacteriologist, each £920–£40–£1280; five health officers, £860–£40–£1220; second health officer of port, assistant bacteriologist, radiologist, each £860–£40–£1220; eight medical officers, £700–£40–£1180. The currency of Hong-Kong is based on the silver dollar. For purposes of local payment salaries fixed in sterling are converted into dollars at the current rate of exchange. If quarters are provided a rental of 7 per cent. on salary is charged. In certain instances a rent allowance is paid instead.

West Indian Colonies.

Jamaica.—There are 44 district medical officers who, if on a whole-time basis, draw £600–£25–£800 with travelling allowance and unfurnished quarters or an allowance in lieu. The public hospital, Kingstown, has a staff of six, the senior medical officer drawing £700–£50–£800. The chief post in the colony is that of superintending medical officer, £1100–£50–£1200. Whole-time officers are not allowed private practice. The age for voluntary retirement is 60. Pension is reckoned at the rate of one-sixtieth of the retiring salary for each year of service.

Trinidad and Tobago.—In Trinidad and Tobago there are about 40 appointments. Government medical officers receive salary at the rate of £400 per annum, rising by annual increments of £25 to £600. An officer appointed to a district receives, in addition to his salary, a travelling allowance varying from £100 per annum in a normal district to £150 per annum, and is allowed private practice, for which there is good scope. Officers employed in institution work receive a duty allowance varying from £50 to £300. Medical officers having completed 10 years' resident service are pensionable at the age of 55.

Windward Islands (Grenada, St. Lucia, St. Vincent). There are over 25 appointments. The chief medical officer, Grenada, receives £750, and also an allowance of £50 as bacteriologist. The chief medical officer, St. Lucia, receives £600–£700 plus forage and subsistence allowances; the post is pensionable, but private practice is not allowed except as a consultant. The chief medical officer, St. Vincent, receives £500–£600, with free quarters valued at £40. Most of the remaining appointments are district appointments with the right to private practice attached; the salaries paid by Government are, in Grenada, on the scale £500–£600, in St. Lucia, £400–£500, in St. Vincent, £400–£450. The Governor has the power to transfer a medical officer from one island to another. Appointments are pensionable.

Leeward Islands (Antigua, St. Christopher and Nevis, Dominica, Montserrat, Virgin Islands).—The appointments are similar in number and character to those in the Windward Islands, and are pensionable. An officer when first sent out is not appointed to a particular island but to the service of the Leeward Islands, with a salary of £350, and is later appointed to a definite district at a salary varying from £312 to £400–£25–£450, and the Governor decides as to the district which is to be allotted to him. He is liable to be transferred at the Governor's discretion to any medical district in the Leeward Islands. The medical officers, except in St. Christopher and Nevis, receive fees for successful vaccinations, post-mortem examinations, evidence at courts of justice, and certificates of lunacy. They are also, as a rule, allowed private practice. The chief medical officer, St. Christopher and Nevis, receives £930 and a travelling allowance, but is not allowed private practice, except as a consultant.

British Guiana.—There are the following posts in the medical service of the colony: surgeon-general, £1000–£1200 per annum, with consulting practice; medical officer of health, £900; ophthalmologist, bacteriologist, pathologist, each £700: 37 medical officers at £500–£25–£700. Most of the senior posts in institutions carry duty allowances (varying from £50 to £300 per annum) and quarters.

British Honduras.—There are seven assistant medical officers at a salary of £500–£25–£650. The principal draws £825–£25–£850, paid in dollars. Unless they already possess a diploma of public health, medical officers are liable to be required, before they join the colony, to undergo a course of instruction at a laboratory of public health or analogous institution. The appointments are pensionable.

In British Guiana, Jamaica, and Trinidad officers are allowed to accumulate full-pay leave (at the rate of six weeks for each year's service) up to six months, and no leave of absence may (except in very special circumstances) exceed six months in all unless the officer has served for five years or more without leave, in which case two months on half-pay may be taken in addition to six months' full-pay leave.

Western Pacific.

Fiji.—The chief medical officer receives £1000–£50–£1100, with free unfurnished quarters; the medical superintendent, Colonial War Memorial Hospital, £800–£25–£1000, and free quarters: the medical superintendent, Leper Asylum, £700–£50–£950, with completely furnished quarters and one servant, the medical officer of health, £750–£25–£900, no quarters provided. There are 14 district medical officers who receive £500–£25–£725, with partly furnished quarters or £50 house allowance (at the option of the Government) and duty allowance of £50 per annum in districts where no private practice exists. In certain districts horse allowances or car allowances are granted. In others a medical officer is provided with a launch or boat. District medical officers are allowed private practice on the understanding that their official duties are not neglected. In four districts the medical officer is also district commissioner and receives an additional allowance of from £175 to £275 and free partly furnished quarters. In most districts there is private practice, the value of which has been estimated at from £100 to £600 a year.

Western Pacific.—The staff in the British Solomon Islands Protectorate consists of a senior medical officer (£650–£50–£750), two district medical officers and one travelling medical officer (£550–£25–£650), with partly furnished quarters and a local allowance of £50, and a travelling allowance of £200.

In the Gilbert and Ellice Islands Colony there is a senior medical officer (£650–£25–£750), with partly furnished quarters, and one medical officer (£600–£25–£650), with partly furnished quarters or house allowance. There is hardly any private practice in the protectorate or colony.

Mediterranean Colonies.

Cyprus.—There is a director of health (£1000–£25–£1200), an assistant director (£600–£25–£750), and three district medical officers (£400–£20–£600), one of whom is allowed full private practice. The specialist in venereal diseases (£700) and the surgical specialist (£400–£20–£600) are allowed consulting practice.

Gibraltar.—There is a surgeon of the Colonial Hospital receiving £730, with private practice. There are also two assistant surgeons with a salary of £600 for 3 years and thereafter £650–£25–£700 per annum, who are allowed private consulting practice only. Free quarters, unfurnished, are provided for all three officers.

Island Group.

Falkland Islands.—A colonial surgeon is paid at the rate of £800 per annum, with free furnished quarters, and £200 in lieu of private practice. His assistant receives £700–£25–£800, with quarters, and is not allowed private practice. The offices are pensionable.

Seychelles.—The chief medical officer receives £600 and the resident surgeon £487 10*s.* per annum, with quarters. There are three assistant medical officers, two receiving £487 10*s.*, the other £337 10*s.* per annum, paid in rupees. Private practice is allowed.

St. Helena.—A colonial surgeon receives £550, with fees estimated at £27, and £30 horse allowance. His assistant receives £500 and horse allowance. Private practice is allowed, and such practice, together with the duties of non-Government appointments, is divided between the two officers in a proportion approved by the Governor. The value of these is estimated at about £536.

Middle East.

Palestine.—The grades and salaries of higher appointments in the department of health are: director, £1200, plus £200 expatriation allowance. Deputy director, £900–£50–£1100, plus £150 expatriation allowance. Assistant director (laboratories), specialist surgeon (who is allowed a certain amount of private practice), and five senior medical officers, £750–£25–£950, plus £100 expatriation allowance. One senior medical officer and Government analyst, £550–£25–£750, plus £100 expatriation allowance. Payment is in Palestinian pounds, now equal to sterling. The remainder of the staff is recruited locally. Three months' leave with full pay can be taken every two years. Most of the senior appointments have been or will be made pensionable.

Iraq.—Certain medical appointments are filled normally upon the recommendation of the Secretary of State for the Colonies. Every officer who accepts employment under the Government of Iraq is required to enter into an agreement to serve that Government for a period of 3, 5, 10 or 15 years. The grades and salaries of the principal appointments in the department of health are: inspector-general of health, Rs.1800–100–2800 a month; health specialists, directors of hospitals and institutes, chief medical officers in Mosul and Kirkuk, medical officers of health in Bagdad and Basra, Rs.1500–75–1600–100–2300 a month; medical officers, Rs.1200–75–1800 a month. Posts in the service of the Government of Iraq are not pensionable. Every officer (unless serving on a three years' contract) is required to contribute one-twelfth of his pay to a provident fund, to which the Government makes a contribution equal to one-sixth of his pay.

APPOINTMENTS NOT WITHIN THE COLONIAL SERVICE.

Appointments in the self-governing Dominions and the territories administered by them—viz., Canada, the Commonwealth of Australia (including Papua, Norfolk Island, and the mandated territory of New Guinea), New Zealand (including the Cook Islands and the mandated territory of Samoa), the Union of South Africa (including the mandated territory of South West Africa), the Irish Free State, and Newfoundland—are entirely under the control of the respective Dominion Governments. For information with regard to them application should be made to the High Commissioners or Agents-General in London.

Sudan Medical Service.

This service is responsible for carrying out civil, medical, and public health duties in the Sudan. The country is developing rapidly, and the Medical Department is being increased to meet its growing requirements.

The staff consists of: (*a*) A director, pay £E.1500–£E.2000. (*b*) A senior physician and a senior surgeon to the Khartoum and Omdurman Civil Hospitals, each with a pay of £E.1200–£E.1750. (*c*) An assistant director. (*d*) Medical officer of health, Khartoum Province, at a special rate of pay. (*e*) 31 British "senior medical inspectors" and "medical inspectors" whose pay commences at £E.720 and rises, subject to the recommendation of the director, by five biennial increases to £E.1080, and after 13 years' service to £E.1200. The senior medical inspectors are eligible, by selection, for the four senior posts. All medical inspectors are appointed, in the first place, on probation for two years, and if at the end of that time they are accepted for permanent service under the Sudan Government, the first increase of pay is subject to their passing an examination in Arabic.

In addition to the above there are (*f*) a number of medical officers trained at one of the Syrian medical schools, besides (*g*) Sudanese medical officers trained at the school of medicine at Khartoum. There are several native (*h*) assistant medical officers, who have been given a purely practical training in one of the larger hospitals in the Sudan.

Amongst the attractions of the service are: The great variety of the work met with among many different races of the Sudan; *leave* of 90 days, generally granted every year after the first 18 months of service; *study-leave*, which may be given for some definite purpose, whilst two years towards pensionable service may be granted to those who have special qualifications and experience. The pension for medical inspectors who retire after 20 years' service is not less than £E.500 a year. If, however, he serves for a longer period, or is appointed to one of the higher posts, he will receive a larger pension. Private practice is allowed, but is limited to a few of the larger towns, and may be carried on so long as it does not interfere, in any way, with official duties. These duties include acting as consultant to the principal hospitals and the supervision of medical and public health work, the inspection of schools, the examination of candidates for Government service and pension, and the training of assistant medical officers and native sanitary overseers. The Khartoum Medical School is staffed mainly by members of the medical service, who receive additional remuneration for their work as teachers. A registrar of the medical school is also selected from the service, who receives £E.250 a year extra pay.

Inquiries for further information should be made to the Deans of the Principal Medical Schools, and applications to the Controller, Sudan Government Office, Wellington House, Buckingham Gate, London, S.W. 1.

Southern Rhodesia.—Appointments are under the control of the Government of Southern Rhodesia. Information from the High Commissioner, Crown House, Aldwych, London, W.C. 2.

Malta.—Inquiries should be addressed to the secretary to the Head of Ministry, Malta.

North Borneo.—Application to the British North Borneo Company, 17, St. Helen's-place, London, E.C. 2.

Sarawak.—Appointments are in the hands of H.H. the Rajah. Information from the Sarawak Government Offices, 2, Millbank, London, S.W. 1.

Basutoland, Swaziland, and the Bechuanaland Protectorate.—Appointments are made upon the recommendation of the resident commissioners, subject to the approval of the High Commissioner for South Africa and confirmation by the Secretary of State for Dominion Affairs. These appointments are usually filled by the selection of local candidates.

Shanghai Municipal Appointments.—Inquiries regarding appointments under the Shanghai Municipality, including appointments in the Shanghai Police Force, should be addressed to Messrs. J. Pook and Co., 68, Fenchurch-street, London, E.C. 3.

Chinese Maritime Customs.—Inquiries regarding appointments should be addressed to the Inspector-General of the Chinese Maritime Customs, 26, Old Queen-street, London, S.W. 1.

Consular Appointments.—Application for appointments of a Consular nature should be addressed to the Foreign Office, London, S.W. 1.

Trade Commissionerships.—Applications for appointment as trade commissioner in the colonies and elsewhere should be addressed to the Department of Overseas Trade (Development and Intelligence), 35, Old Queen-street, London, S.W. 1.

WOMEN'S MEDICAL SERVICE FOR INDIA.

AMONG careers open to medical women abroad the Women's Medical Service for India deserves honourable mention. The Service is open to fully qualified medical women of British or Indian nationality, and with the present amount of Government subsidy the number of medical officers is limited to 44. Medical women proceeding to India to join the Women's Medical Service receive a sufficient sum for a first-class passage to India. On landing they are posted to one of the larger women's hospitals to gain Indian experience and to learn the language. For a further period they are appointed to act temporarily for medical women on furlough. They are then definitely appointed to the charge of hospitals. Private practice is allowed, provided it does not interfere with official duties. The only exception is in administrative or educational posts, when an allowance in lieu of practice is given. The amount obtained from practice varies according to the station, but in most cases it forms a fair addition to the salary, varying from £150 to £1000 a year.

Excellent opportunities for surgery—especially gynæcological—are found in the Women's Medical Service. To those who are not keen surgeons opportunities are likely to open in the future in connexion with maternity and child welfare.

The cost of living in India is much higher than formerly, but it should be possible for a medical woman (with house provided) to meet actual household expenses for about Rs.300 per mensem, leaving the remainder of her salary for dress and personal expenses. To this must be added the necessary saving to meet additional expense for furlough and leave spent in the hills.

Rates of pay are as follows :—

Years of service.	Overseas allowance per mensem.	Salary per mensem.	English equivalent* per annum.
1 to 3	Rs.100	Rs.450	£440
4 to 6	,,	Rs.500	£480
7 to 9	,,	Rs.550	£520
10 to 12	,,	Rs.600	£560
13 to 15	Rs.150	Rs.650	£600
16 to 18	,,	Rs.700	£640
19 to 21	,,	Rs.750	£680
22 to 24	,,	Rs.800	£720
over 24	,,	Rs.850	£760

* At rupee value 1s. 4*d*.

Furnished quarters are provided, representing an additional Rs. 150 per mensem.

Leave on average pay is earned at the rate of 2/11ths of the period spent on duty.

Study-leave is granted to the extent of 12 months in the total service and will not be granted more than twice in the course of an officer's service. During study-leave an officer draws half average pay, with a study allowance at the rate of 12*s*. a day during the course of study. Officers of European domicile are entitled to four free return first-class passages from a port in India to a port outside India in their whole service. The first passage is not granted until after the expiry of four years' approved service, and thereafter passages may be granted at intervals of not less than four years. There is a Provident Fund to which members of the service contribute 10 per cent. of their pay. The service contributes another 10 per cent., which accumulates at interest and is repaid on retirement.

Admission to the service is made by selection in India and England—preference being given to those with Indian experience. Vacancies are few. Candidates in the United Kingdom should apply to the Hon. Secretary, United Kingdom Branch of the Countess of Dufferin's Fund, care of Major-General Sir Leonard Rogers, India Office, Whitehall, London. Candidates in India should apply to the Chief Medical Officer, Women's Medical Service, Countess of Dufferin's Fund, Simla and Delhi.

PRISON MEDICAL SERVICE.

CANDIDATES for the Prison Medical Service are approved by the Secretary of State for the Home Department on the recommendation of the Prison Commissioners. Preference is always given to candidates who have experience of lunacy. Application for employment may be made on a special form, which can be obtained from the Secretary, Prison Commission, Home Office, London, S.W. In the smaller prisons the medical officership is part-time, and is usually filled by practitioners in the locality, preference being given to those who have special experience of lunacy. In the large prisons the medical staff must devote their whole time to the Service. In the case of whole-time service, the appointment is in the first instance to the post of Medical Officer, Class II., and from this rank the Medical Officers, Class I., are selected as vacancies occur. The pay of the whole-time prison medical staff is as follows: Medical Officer, Class II., £350, rising by annual increments of £20 to £600, making the pay at present with bonus £456 8*s*. to £738 12*s*.; Medical Officer, Class I., £650, rising by annual increments of £25 to £800, plus bonus, making the pay £797 3*s*. to £953 13*s*. Unfurnished quarters are provided or an allowance in lieu is made. Study-leave is granted annually to two of the whole-time Medical Officers. There are 12 full-time medical officers of Class I. and 15 Class II., and 23 part-time medical officers. The number of vacancies is never large.

SPECIAL DIPLOMAS

DIPLOMA IN PUBLIC HEALTH.

THE following epitomises the instruction given at various universities and centres of medical education to medical men desiring to obtain diplomas in sanitary science, public health, hygiene, or State medicine, as this discipline is variously called. Resolutions, designed with a view of ensuring "the possession of a distinctively high proficiency, scientific and practical, in all the branches of study which concern the public health," have been adopted at various times by the General Medical Council. The diploma is registrable by the Council whose rules on the curriculum become binding on the educational bodies concerned. The new regulations, which came into force in 1924, extend the period of study and postpone the granting of a diploma until at least two years from qualification.

London School of Hygiene and Tropical Medicine.

The course of study for the Diploma in Public Health will *commence on Sept.* 28th in the premises in Keppel-street (Gower-street), the gift of the Rockefeller Foundation, which has excellent laboratories and research rooms, a fine lecture theatre and classrooms, library, and museum. The course, which will extend over a period of nine months' whole-time study, is designed in compliance with the requirements of the General Medical Council, to enable students to proceed to the academic Diploma in Public Health of London University. The curriculum has been planned on very practical lines, and includes, in addition to work with Medical Officers of Health in two selected areas, a large number of visits to places of public health interest. A series of 5 o'clock lectures is given by eminent authorities on special subjects, and these lectures will be open to members of the medical profession as well as to students of the School. The London County Council, the City of London, and various other bodies have placed their resources at the disposal of the School for teaching purposes.

An interesting recent development is the establishment in the School of a University Chair of Medical Industrial Psychology.

English Conjoint Board.

The regulations are as follows: The Examination consists of two Parts. Part I. will be held in the months of January, June, and October, and *Part II.* in the months of January, June, and October in each year. Candidates may enter for Parts I. and II. *separately* or at the *same* time, but they must pass Part I. before proceeding to Part II. The Examination in each part will be written, oral, and practical. Part II. will include a practical examination in Infectious Diseases, Food Inspection, and Inspection of selected Premises. Candidates who fail to satisfy the Examiners in either part may present themselves again at the next Examination on payment of the same fees. Candidates intending to present themselves for either part of the Examination must give 14 days' notice in writing to the Secretary, at the *Examination* Hall, Queen-square, London, W.C.1.

Candidates will be admissible to Examination in Part I. on producing evidence:—

1. Of being in possession of a registrable qualification in Medicine, Surgery, and Midwifery.

2. Of having attended *during a period of* not less than five months at an Institution recognised by the Examining Board in England, practical instruction in (*a*) Bacteriology and Parasitology (including Medical Entomology) especially in their relation to diseases of man and to *those* diseases of the lower animals which are transmissible to man, during 180 hours, of which not less than 150 *hours* have been occupied in practical laboratory work. (*b*) Chemistry and Physics in relation to public health, during 90 hours, of which not less than 70 *hours* have been occupied in practical laboratory work. (*c*) Meteorology *and Climatology* in relation to public health, during not less than 10 hours.

Candidates will be admitted to Part II. of the Examination on producing evidence:—

1. Of having been in possession of a registrable qualification in Medicine, Surgery, and Midwifery during not less than two years, of being *registered by the* General Medical Council, and of having completed the curriculum *for the* Diploma extending over a period of 12 calendar months subsequent to the attainment of a registrable qualification.

2. Of having attended, *after obtaining the registrable* qualification, instruction during not less than 80 hours at an Institution recognised by the Examining Board in England in the following subjects:—(*a*) The Principles of Public Health *and* Sanitation for not less than 30 hours; (*b*) Epidemiology *and* Vital Statistics for not less than 20 hours; (*c*) Sanitary Law and Administration (including Public Medical Services) during *not* less than 20 hours; (*d*) Sanitary Construction and Planning during not less than *10 hours*.

3. Of having attended for three months the clinical practice *of a* hospital for infectious diseases recognised by the Examining Board in England and of having therein received instruction in the methods of administration. The certificate must state that the candidate has *attended* on one or more days in each week of the three months, that *each attendance* was of two hours' duration, with a total attendance of 60 hours.

4. Of having been engaged during a period of not less than six months in acquiring a practical knowledge of the duties, routine and special, of public health administration under the supervision of a Medical Officer of Health, and of having received, from such officer or other competent *Medical Officer during not less* than three hours on each of 60 working days, practical instruction in those *duties and* also those relating to: (*a*) Maternity and Child Welfare Service; (*b*) Health Service for children of school *age*, (*c*) Venereal Diseases Service; (*d*) Tuberculosis Service; (*e*) Industrial Hygiene; (*f*) Inspection and Control of Food; including meat and milk.

The above certificate (4) must be obtained from a Medical Officer of Health who devotes his whole time to public work, or from a Medical Officer of Health of a Sanitary Area having a population of not less *than* 50,000, or in Ireland the Medical Superintendent Officer of Health of a County or County Borough having a population of not less than 50,000.

NOTE.—Revised Regulations are applicable to candidates who begin the recognised study of Public Health work after Oct. 1st, 1931.

University of London.

Candidates for the M.D. Degree may offer State Medicine as a subject in which to graduate. The regulations may be obtained on application to the Academic Registrar, University of London, South Kensington.

University of Durham.

The Degree of Bachelor of Hygiene (B.Hy.) and the *Diploma* in Public Health (D.P.H.).—No candidate is admitted to the final examination for the Degree of B.Hy. *unless* he is a Bachelor of Medicine and Surgery, of not less than two years' standing, of a recognised University whose degrees are registrable on the books of the General Medical Council of the United Kingdom, and no candidate is admitted to the *final* examination for the D.P.H. unless he is a registered medical practitioner, of not less than two years' standing. The course of study for the B.Hy. and D.P.H. extends over a period of not less than 12 calendar months, subsequent to the attainment of a *qualification* registrable by the General Medical Council of the United Kingdom. Candidates for the B.Hy. must attend this course at the University of Durham; candidates for the D.P.H. may attend it at the University of Durham, or at any medical school or *institution* which is recognised by the University. The examination for the diploma or degree is divided into two parts. A candidate *must* pass in all the subjects of

Part I. before being admitted to examination for Part II. In Part I., and also in Part II., a candidate must pass in all the specified subjects at one time. The examination for Part I. is practical, written, and oral, and includes the following subjects: Bacteriology and Parasitology (including medical entomology); Chemistry and Physics, and Meteorology and Climatology, in relation to Public Health. Candidates are not admitted to examination for Part I. until after they have completed the prescribed courses of instruction in the subjects thereof. The examination for Part II. includes Hygiene and Sanitation (comprising sanitary construction), Epidemiology and Infectious Diseases; Sanitary Law and Vital Statistics; Public Health Administration. The examination is written and oral, and includes practical examinations in Infectious Diseases, Food Inspection, Inspection of Premises—Dwellings, Factories, Workshops, Schools, &c. Candidates are not admitted to examination for Part II. until after they have completed the prescribed courses of instruction in the subjects thereof. Doctor of Hygiene (D.Hy.): Candidates must be Bachelors of Hygiene of the University of two years' standing, and are required to satisfy the examiners that they have conducted original research in the subject of Public Health.

NOTE.—The courses of instruction for the B.Hy. and D.P.H. are suspended for the year 1931–32.

University of Birmingham.

Under the rules and regulations of the General Medical Council the University grants a degree of B.Sc. in Public Health and also a Diploma in the same subject on the following conditions: Graduates in Medicine of this University may become candidates for the degree of Bachelor of Science in Public Health by conforming to all the requirements laid down for candidates for the Diploma in Public Health, except that after graduating in Medicine all courses of study must be taken out in the University, and they must, in addition, have attended a three months' course of Geology in the University. A Thesis on the Ætiology and Prevention of a Disease of which the candidate has made a special study must be submitted on entry for B.Sc. Part II. The examinations will be held in March and June (Part I.), October and March (Part II.), each part being written, oral, and practical. No candidate will be allowed to pass Part II. until he has passed Part I. Candidates may enter for Parts I. and II. separately or at the same time (in March). The fee for each part of the examination is £6 5*s*. Medical Officers of the Royal Navy who have attended the required course of study at the Naval Medical School, Greenwich, will be admitted to Part I. examinations for the Diploma in Public Health, whether they have previously been students at the Birmingham School or not; and the same applies to officers of the Royal Army Medical Corps who have studied at the Staff College. Medical officers of the Navy and Army are admitted to Parts I. and II. Examination (D.P.H.) on complying with the requirements laid down for attendance upon Courses of Study. These Courses need not necessarily be attended in the University of Birmingham.

University of Liverpool.

The University grants a Degree in Hygiene (M.H.) and a Diploma (D.P.H.), and every facility is afforded for training in Sanitary Science and State Medicine. The curriculum for the Degree extends over a period of two years, the first of which is devoted to laboratory instruction and practical classes (including those for the Diploma); the second being devoted to advanced study and research. The courses may be taken at any time, and students are allowed to work daily in the laboratories.

University of Leeds.

The University grants a Diploma in Public Health, and every facility is afforded for training in Sanitary Science and State Medicine. The examination, which is held twice in each year—namely, in March and September—is in two parts, and is written, oral, and practical. Candidates must pass in Part I. before being admitted to Part II. Instruction in Entomology and Meteorology is given in the first term, and in Sanitary Chemistry and Bacteriology in the second and third terms. Practical work under arrangement with the Leeds City Council. Prospectus can be obtained from the Academic Sub-Dean of the Medical School.

University of Bristol.

Diploma in Public Health. Candidates must be at least 23 years of age, shall be fully registered medical practitioners of not less than two years' standing as such, and shall have passed the examination prescribed by regulations, which can be obtained from the Registrar upon application.

University of Wales.

Candidates for the Diploma in Public Health, the curriculum for which extends over a period of not less than twelve calendar months, or an academic year of whole-time study covering a period of not less than nine calendar months, subsequent to the attainment of a registrable qualification, must produce evidence of having pursued at the Welsh National School of Medicine courses of instruction in Bacteriology and Parasitology, Chemistry, Physics, Radiology and Electrology, and Meteorology and Climatology in relation to Public Health, and Physiology and Biochemistry in their application to nutrition and hygiene. Candidates must also satisfy the examiners that they have received instruction approved by the University in the Principles of Public Health and Sanitation, Epidemiology and Vital Statistics, Sanitary Law and Administration, and Sanitary Construction and Planning. The candidate must produce evidence that he has attended for three months on the clinical practice of a hospital for infectious diseases containing not less than 100 beds, and has received therein instruction in the methods of administration, and that he has for a period of not less than six months been engaged in acquiring a practical knowledge of the duties, routine and special, of a public health administration under the supervision of a medical officer of health. The examination for the diploma is divided into two parts, Part I. and Part II., each of which extends over not less than two days. A candidate must pass in all the subjects of *Part I.* before being admitted to Part II. of the examination. In Part I., and also in Part II., a candidate must pass in all the specified subjects at one time. Part I. of the examination is practical, written, and oral, and comprises Bacteriology and Parasitology (including immunology, serology, medical entomology), Chemistry, Radiology and Electrology, Physics and Meteorology and Climatology in relation to Public Health, and Physiology and Biochemistry in their application to nutrition and hygiene. Candidates may not be admitted to Part I. of the examination until they have been certified as having pursued the prescribed courses of instruction in the subjects thereof. Part II. of the examination, which is written and oral, comprises: The principles of Public Health and Sanitation, Epidemiology and Vital Statistics, Sanitary Law and Administration (including Public Medical Services), and Sanitary Construction and Planning. No candidate can be admitted to Part II. of the examination until after the lapse of not less than two years from the date of his obtaining a registrable qualification in Medicine, Surgery, and Midwifery, which qualification must be registered in the Medical Register before admission to Part II. of the examination. An examination in each part will be held annually. The examination in Part I. will be held in June, that in Part II. in October. Full information may be obtained from the Registrar of the University, University Registry, Cathays Park, Cardiff. Entries for the examination in Part I. must be received by him not later than May 1st, and not later than Sept. 1st for the examination in Part II.

University of Edinburgh.

Candidates for the Diploma in Public Health must be graduates in medicine and surgery of the University, or hold corresponding degrees or registrable medical qualifications which must be registered before admission to examination. The course is divided into two parts for which examinations are held twice yearly. In each part the candidate must pass in all the specified subjects at one examination. Candidates are not admitted to Part II. until they have passed Part I., nor until after the lapse of not less than two years from the date of obtaining a registrable medical qualification. The subjects of the examination are: Part I. (written, oral, and practical), Bacteriology; Medical Entomology and Parasitology; Chemistry; Biochemistry and Physiology in their application to nutrition and hygiene; Physics, Radiology, Electrology, Meteorology and Climatology in relation to Public Health. Part II. (written, oral, and practical), Hygiene, Sanitation, and Sanitary Construction; Epidemiology and Infectious Diseases; Sanitary Law and Vital Statistics; Public Health Administration. There is also included practical examinations in Infectious Diseases, Food Inspection, and Inspection of Premises. The course, which extends over an academic year of full-time study, begins in October, and provision is made by the University for instruction in all the subjects. Detailed particulars may be obtained from the Dean of the Faculty of Medicine.

University of Aberdeen.

Every candidate for the Diploma in Public Health must be a graduate in medicine of the University of Aberdeen, or of any other University whose medical degrees are recognised as qualifying for registration by the General Medical Council of the United Kingdom. No candidate will be admitted to the Final Part of the Examination for the Diploma until after the lapse of not less than two years from the date of his obtaining a registrable qualification in Medicine, which qualification shall have been registered before such admission. The whole of the prescribed curriculum of study must be undertaken after the candidate has obtained a registrable qualification in medicine, and shall extend over not less than twelve calendar months (or an academic year of whole-time study covering a period of not less than nine calendar months). At least one academic term must be spent at the University of Aberdeen. Candidates shall produce evidence of having complied with the following requirements in respect of study and training:—1. Practical instruction in the following subjects within a laboratory or laboratories approved by the University during not less than 280 hours: (*a*) Bacteriology and Parasitology (including immunology, serology, medical entomology, &c.), in relation to diseases of man and diseases of lower animals transmissible to man; (*b*) Chemistry, Physics Radiology and Electrology, in relation to Public Health; (*c*) Physiology and Biochemistry in their application to nutrition and hygiene; (*d*) Meteorology and Climatology, in relation to Public Health. The above instruction to extend over not less than five months or two academic terms. 2. A course or courses of instruction extending over not less than 120 hours dealing with: (*a*) The Principles of Public Health and Sanitation; (*b*) Epidemiology and Vital Statistics; (*c*) Sanitary Law and Administration (including Public Medical Services); (*d*) Sanitary Construction and Planning; such course or courses to be given at an institution or by a teacher or teachers approved by the University. 3. Practical instruction, clinical and administrative, within a recognised hospital for general infectious diseases; such instruction to extend over three months, and to include 21 daily attendances of not less than two hours each. 4. Practical instruction and experience, during not less than six months (including attendance of at least three hours on each of sixty working days) in the duties, routine and special, of public health administration, under the supervision of a medical officer of health, who shall certify that the candidate has received from this officer or other competent medical officer, practical instruction in these duties and also in those relating to: (*a*) Maternity and Child Welfare Service; (*b*) Health Service for Children of School Age; (*c*) Venereal Diseases Service; (*d*) Tuberculosis Service; (*e*) Industrial Hygiene; (*f*) Inspection and Control of Food, including meat and milk. (Instruction in (*a*) to (*f*) shall include attendance at the centres, clinics, institutions, and premises concerned.) The medical officers of health recognised for this purpose by the General Medical Council are: (*a*) a medical officer of health who devotes his whole time to public health work; or (*b*) the medical officer of health of a sanitary area having a population of not less than 50,000; or (*c*) in Ireland, the medical superintendent officer of health of a county or county borough having a population of not less than 50,000. The examination for the diploma is divided into two parts, each of which extends over not less than three days. A candidate must pass in all the subjects of Part I. before being admitted to the examination for Part II. In Part II. and also in Part II. a candidate must pass in all the specified subjects at one time.

University of Glasgow.

Degree of B.Sc. in Public Health.—Candidates must be graduates in Medicine of a University of the United Kingdom, or of some other University recognised for the purpose by the University Court. Candidates must produce evidence (1) that, after they have obtained a registrable Degree in Medicine, a period of not less than two years has elapsed; (2) that, after they have obtained a registrable degree in Medicine, they have, during a period of not less than 21 calendar months, pursued the course of work and instruction prescribed, and have satisfied the examiners in the prescribed examinations.

There are two examinations. Part I. includes the following subjects: (i) Bacteriology and Parasitology (including Medical Entomology); (ii) Chemistry and Physics in relation to Public Health; (iii) Meteorology and Climatology in relation to Public Health; (iv) Higher Chemistry in relation to Public Health; (v) Physics and Geology. A candidate must pass in the subjects marked (i), (ii), and (iii) of Part I. at one examination. Part II. includes the following subjects: (vi) Hygiene and Sanitation (including Sanitary construction); (vii) Epidemiology and Infectious Diseases; (viii) Sanitary Law and Vital Statistics; (ix) Public Health Administration; (x) Applied Hygiene. The examination for Part II. includes practical examinations in Infectious Diseases; Food Inspection; Inspection of Premises, such as dwellings, factories, workshops, schools, and the like. The examination in Applied Hygiene may be on a selected subject professed by the candidate. A candidate must pass in the subjects marked (vi), (vii), (viii), and (ix) of Part II. at one examination. *Diploma in Public Health (D.P.H.).*—Candidates for this Diploma must be legally qualified medical practitioners who are matriculated students of the University. A period of not less than two years must elapse between the attainment by the candidate of a registrable medical qualification, and his admission to the final examination (Part II.) for the Diploma. The candidate must, during a period of not less than 12 calendar months, subsequent to his attainment of a registrable medical qualification, pursue the course of work and instruction prescribed, and pass the prescribed examinations. The examination, which is both written and oral, is divided into two parts, Part I. and Part II., each of which extends over not less than two days. No candidate is admitted to either part of the examination until he has completed the prescribed courses of instruction in the subjects of that part. No candidate is admitted to Part II. until he has passed in all the subjects of Part I., nor until after the lapse of not less than two years from the date of his obtaining a registrable medical qualification, nor unless he presents a certificate showing that his name and qualification have been duly registered in the Medical Register. Part I. includes: (i) Bacteriology and Parasitology (including Medical Entomology); (ii) Chemistry and Physics in relation to Public Health; (iii) Meteorology and Climatology in relation to Public Health. A candidate must pass in all the subjects at one examination. Part II. includes: (iv) Hygiene and Sanitation (including Sanitary Construction); (v) Epidemiology and Infectious Diseases; (vi) Sanitary Law and Vital Statistics; (vii) Public Health Administration. A candidate must pass in all the subjects at one examination. The examination for Part II. includes practical examinations in Infectious Diseases; Food Inspection; Inspection of Premises, such as dwellings, factories, workshops, schools, and the like.

University of St. Andrews.

The Diploma in Public Health is open to those who hold a registered medical qualification of the United Kingdom. The examination is in two parts. (1) (*a*) Bacteriology and Parasitology; (*b*) Chemistry and Physics; (*c*) Meteorology and Climatology. (2) Public Health and Sanitation, Epidemiology and Vital Statistics, Sanitary Law and Administration, and Sanitary Construction and Planning. Before admission to the first examination the candidate must have held his medical qualification for one year, and before admission to the second examination for two years. Graduates in Medicine of the University of St. Andrews may take part or all of the qualifying classes in any University of the United Kingdom, or in any Indian, Colonial, or Foreign University or medical school recognised by the University Court, but holders of other registered medical qualifications must spend at least eight out of the 12 months' curriculum in St. Andrews University. A complete course is given in the Conjoint Medical School, Dundee.

Scottish Conjoint Board.

All candidates for the Diploma in Public Health must have a qualification which has been registered under the Medical Acts. The examination is divided into two parts.

For Part I. the candidate must produce evidence of having received during a period of not less than five months at an institution recognised by the Board practical instruction in: (*a*) Bacteriology and Parasitology (including Medical Entomology), especially in their relation to diseases of man and to those diseases of the lower animals which are transmissible to man, during 180 hours, of which not less than 150 hours have been occupied in practical laboratory work; (*b*) Chemistry and Physics in relation to Public Health during 90 hours, of which not less than 70 hours has been occupied in practical laboratory work; (*c*) Meteorology and Climatology in relation to Public Health during not less than 10 hours. For Part II. evidence must be given of having received instruction during not less than 80 hours in: (*a*) The Principles of Public Health and Sanitation for not less than 30 hours; (*b*) Epidemiology and Vital Statistics for not less than 20 hours; (*c*) Sanitary Law and Administration (including Public Medical Services) during not less than 20 hours; (*d*) Sanitary Construction and Planning during not less than 10 hours; of having attended for three months the clinical practice of a recognised hospital for infectious diseases; and of having been engaged during a period of not less than six months in acquiring a knowledge of Public Health administration in addition to practical instruction in the duties relating to: (*a*) Maternity and Child Welfare Service; (*b*) Health Service for Children of School Age; (*c*) Venereal Diseases Service; (*d*) Tuberculosis Service; (*e*) Industrial Hygiene; (*f*) Inspection and Control of Food, including meat and milk. The fee is 12 guineas for both examinations, or 6 guineas for either of them. A fee of 6 guineas is payable by rejected candidates for either examination. The examination is held twice yearly, in March in Glasgow, and October in Edinburgh. The published regulations provide detailed synopses of the subjects of examination. The Registrar for Edinburgh is Mr. David Thomson, 49, George-square, and for Glasgow, Mr. Walter Hurst, 242, St. Vincent-street.

University of Dublin (Trinity College).

The Diploma in Public Health is conferred, after examination, under the following conditions. The candidate must be a registered medical practitioner and have obtained a registrable qualification at least two years before the second part of the examination. The candidate must have completed, subsequently to obtaining a registrable qualification, 280 hours' practical instruction in a chemical and bacteriological laboratory, or laboratories, approved by the University, must have received instruction in the following subjects: Physics, radiology, electrology, physiology, biochemistry, meteorology, and climatology, the principles of public health and sanitation, epidemiology and vital statistics, sanitary law and administration (including public medical services), sanitary construction and planning; must have studied, practically, outdoor sanitary work for six months under an approved officer of health, and must have attended for three months at a fever hospital where opportunities are afforded for the study of methods of administration. The De Renzy Centenary Prize, value about £15, is awarded to the candidate who obtains the highest marks at the June examination each year, provided sufficient merit is shown. A special prospectus may be obtained by application to the Registrar of the School of Physic, Trinity College, Dublin.

National University of Ireland.

At this University there is a Diploma in Public Health, a B.Sc. in Public Health, and a D.Sc. in Public Health.

University of Belfast.

A Diploma in Public Health is given by examination. Every candidate must produce evidence that, after obtaining a registrable qualification, he has during six months received practical instruction in an approved laboratory in which Chemistry, Bacteriology, and the Pathology of the diseases of animals transmissible to man are taught. After obtaining a registrable qualification every candidate must produce evidence that he has attended during three months the practice of a hospital for infectious diseases at which opportunities are afforded for the study of methods of administration. The examination must have extended over not less than four days, one of which shall have been devoted to practical work in a laboratory, and one to practical examination in, and reporting on, subjects which fall within the special outdoor duties of a medical officer of health. The first part of the examination will have reference to the general principles of Sanitary Science, and the second part to State Medicine and to the applications of Pathology and Sanitary Science. The examination in both parts is held twice a year, in March and June.

Irish Conjoint Board.

Every candidate for the Diploma in Public Health must observe the following rules: 1. A period of not less than two years shall elapse between the attainment by a candidate of a registrable qualification in Medicine, Surgery, and Midwifery, and his admission to the Final Examination for a Diploma in Public Health. 2. The curriculum for a Diploma in Public Health shall extend over a period of not less than 12 calendar months subsequent to the attainment of a registrable qualification. 3. Every candidate shall produce evidence of having attended, during a period of not less than five months, at an institution approved by the Licensing Body granting the Diploma, practical instruction in—(*a*) Bacteriology and Parasitology (including Medical Entomology), especially in their relation to diseases of man, and to those diseases of the lower animals which are transmissible to man; (*b*) Chemistry and Physics in relation to Public Health; (*c*) Meteorology and Climatology in relation to Public Health. At least 180 hours must be devoted to Course (*a*), of which not less than 150 hours shall be occupied in practical Laboratory work. At least 90 hours must be devoted to Course (*b*), of which not less than 70 hours shall be occupied in practical Laboratory work. At least 10 hours must be devoted to Course (*c*). 4. Evidence of having received, during not less than 80 hours, at an institution or from teachers approved by the Licensing Body granting the Diploma, instruction in the following subjects: (*a*) The Principles of Public Health and Sanitation; (*b*) Epidemiology and Vital Statistics; (*c*) Sanitary Law and Administration (including Public Medical Services); (*d*) Sanitary Construction and Planning. 5. Evidence that he has attended for three months on the clinical practice of a recognised Hospital for Infectious Diseases. 6. Evidence that he has, during a period of not less than six months, been engaged in acquiring a practical knowledge of the duties, routine and special, of Public Health Administration under the supervision of a Medical Officer of Health. The examination for the Diploma is divided into two parts. The examination for Part I. includes Bacteriology and Parasitology (with Medical Entomology); Chemistry and Physics, and Meteorology and Climatology, in relation to Public Health. The examination for Part II. includes Hygiene and Sanitation (with Sanitary Construction); Epidemiology and Infectious Diseases; Sanitary Law and Vital Statistics; Public Health Administration. The examination, which is written and oral, includes practical examinations in Infectious Diseases; Food Inspection; Inspection of Premises—dwellings, factories, workshops, and schools.

DIPLOMA IN PSYCHOLOGICAL MEDICINE.

The Universities of Cambridge, London, Durham, Leeds, Manchester, Edinburgh, Dublin, National University of Ireland, and the Conjoint Board of the R.C.P. Lond. and R.C.S.Eng. now grant diplomas in psychological medicine under conditions that are fairly comparable in the standard of the tests and in the duration of the courses; the details on these points can be obtained from the various examination bodies.

In London, courses of instruction for the Diploma in Psychological Medicine are given annually at the Maudsley Hospital, Denmark Hill, which has recently been definitely recognised as a school of the University of London. The course consists of two parts, commencing in January, and is adapted for the diploma of the *Conjoint* Board, the University of London, or the University of Cambridge. The parts may be taken separately; also during the year there are other short courses, lectures and demonstrations in psychological medicine.

Maudsley Hospital.

Appointments as clinical assistants are obtainable at the Maudsley Hospital. The holding of such appointments for varying periods satisfies the requirements of the different examining bodies in respect of practical study of mental disorders. The appointments and other facilities for clinical experience are open to qualified medical practitioners apart from the courses of instruction. A course for the Diploma in Psychological Medicine is held annually from January to June at the Central Pathological Laboratory of the London County Mental Hospitals, which is situated in the Maudsley Hospital. Facilities and grants-in-aid are given for research work in psychiatry and allied subjects at the Laboratory. Inquiries as to lectures should be addressed to the Director of the Central Pathological Laboratory, Maudsley Hospital, Denmark Hill, S.E.; and as to clinical facilities, to the Medical Superintendent at the same address.

Bethlem Royal Hospital.

A course of lectures and practical instruction for the Diploma in Psychological Medicine, granted by the various universities and the Conjoint Board, is held at Bethlem Royal Hospital, Monk's Orchard, Eden Park, Beckenham, twice annually, during the spring and autumn. The fee for the full course is 15 guineas. Part A or Part B, however, may be taken separately at a fee of 10 guineas per part. In addition to the above, clinical instruction in Psychological Medicine is given at Bethlem Royal Hospital every morning (except Wednesdays) at 11 A.M. The fee for students is 3 guineas for a period of three months' attendance and for post-graduates a fee of 5 guineas for a like period. A reduction is made to those who attend the Diploma Course. House physicians are appointed at Bethlem Royal Hospital for a term of six months, which may be extended. These appointments are made on May 1st and Nov. 1st in each year, and the vacancies are advertised in the medical papers. Apartments, complete board, attendance, and laundry are provided and also a salary at the rate of £100 per annum. Clinical assistants are often appointed from time to time for periods of three months or longer. These are non-salaried and non-resident posts, but partial board is provided. The Physician-Superintendent, Bethlem Royal Hospital, Monk's Orchard, Eden Park, Beckenham, will supply further particulars.

University of Edinburgh.

Candidates for the Diploma in Psychiatry must be graduates in medicine and surgery of the University of Edinburgh or hold corresponding registrable degrees or qualifications of some other licensing body. Candidates are required subsequent to the date of graduation or obtaining a registrable qualification to have held (*a*) a resident appointment for one year in a hospital for mental disorders approved by the Faculty of Medicine, or alternatively (*b*) a six months' appointment as defined in (*a*) and six months' practical study of nervous diseases in a special or general hospital approved by the Faculty of Medicine. There are two examinations for the Diploma. Part I. comprises: 1. Anatomy of the Nervous System. 2. Physiology of the Nervous System. 3. Psychology and Experimental Psychology. Part II. comprises: 1. Neuropathology. 2. Clinical Psychiatry. 3. Clinical Neurology. 4. An additional subject selected by the candidate from a prescribed list. The examinations are held twice yearly in March and July. Candidates who have held an asylum appointment for a period of five years or more may be exempted from the course of study in one or more subjects of the curriculum. Full particulars can be obtained from the Dean of the Faculty of Medicine.

Dublin University.

A post-graduate diploma in Psychological Medicine is conferred upon registered medical practitioners who have held a resident medical appointment at a recognised institution for the treatment of Mental Diseases for 12 months, or who have held such an appointment for six months and have attended clinical instruction at an approved institution for six months. Candidates must also attend special courses of instruction and pass a special examination. Details can be obtained from the Registrar of the School of Physic, Trinity College, Dublin.

National University of Ireland.

This University confers a diploma in Psychological Medicine; application should be made to the Registrars of the Constituent Colleges, University College, Dublin University College, Cork, and University College, Galway, for all information.

DIPLOMA IN TROPICAL MEDICINE.

Although a qualification in tropical medicine has not been made registrable by statute, a diploma is regarded as indispensable for appointments in the Colonial Medical Service and similar positions abroad. Systematic instruction for these diplomas is given at the Incorporated Liverpool School of Tropical Medicine (founded in 1898) and at the London School of Hygiene and Tropical Medicine, Keppel-street, Gower-street, London, W.C.; while the University of Edinburgh, and the English Conjoint Board grant the diploma.

London School of Hygiene and Tropical Medicine.

The course of instruction in tropical medicine and hygiene has been divided into two parts: Section A, a three months' course of clinical and laboratory instruction, and Section B, a two months' course in tropical hygiene. Each section has been so designed that it can be taken independently of the other, and the examinations by the Conjoint Board will follow closely upon the end of the corresponding course of study. This revised course is recognised by the University of London as a course for Associate students. The dates of the courses for the Session 1931–32 are as follows:—Section A (Clinical and Laboratory Instruction): First course, Sept. 29th to Dec. 18th, 1931; second course, Jan. 4th to March 24th, 1932; third course, April 11th to June 30th, 1932. Section B (Tropical Hygiene): First course, Jan. 18th to March 18th, 1932; second course, April 18th to June 17th, 1932. The course of instruction under Section A includes clinical tropical medicine, applied pathology, medical zoology, and elementary bacteriology. Section B comprises instruction in Tropical Hygiene, including, in relation to hygiene, bacteriology, medical zoology, anthropology, and vital and medical statistics. There has been established within the School a new Division of Clinical Tropical Medicine. The instruction in the new Division will be given by the medical staff of the Hospital for Tropical Diseases and by visiting lecturers. In this way the splendid resources of the hospitals of the Seamen's Hospital Society at Endsleigh-gardens; at the Albert Docks, and elsewhere, become available for the clinical instruction of the students at the School.

University of Liverpool.

The University grants a Diploma in Tropical Medicine. At the end of each full course an examination is held by the University for its Diploma of Tropical Medicine (D.T.M.), which is open only to those who have been through the course of instruction of the school. The subjects of examination are (*a*) Parasitology and Tropical Pathology. (*b*) Entomology. (*c*) Tropical Medicine, including Ætiology, Symptoms, Diagnosis and Treatment of Tropical Diseases. The advanced course consists entirely of Practical and Clinical Laboratory Work, given at the Laboratory at the University. Applications should be made to the Dean of the Medical Faculty, University of Liverpool.

The University also grants a diploma in Tropical Hygiene (D.T.H.). The subjects of examination are (*a*) Tropical Hygiene (including Sanitary Engineering, Vital Statistics and Epidemiology and Applied Parasitology and Entomology). (*b*) Practical Sanitation. (*c*) Bacteriology. (*d*) Chemistry (including Meteorology and Climatology). Two University Fellowships of £100 a year each are open to students of the school, amongst others. Accommodation for research work is to be had at the University Laboratory. The Mary Kingsley Medal is awarded by the school for distinguished work in connexion with Tropical Medicine.

University of Edinburgh.

Candidates for the Diploma in Tropical Medicine and Hygiene must be graduates in medicine and surgery of the University of Edinburgh or hold corresponding registrable degrees or qualifications of some other licensing body. The course of instruction, comprising a primary and a second course, is given during the autumn and spring terms, October to March, and includes Tropical Hygiene, Bacteriology, Entomology and Parasitology, Diseases of Tropical Climates (systematic and clinical), Tuberculosis, and Venereal Diseases. Courses in the subjects included in the Primary Course may be given during the summer term also. Provision is made in the University for instruction in all subjects.

The examinations are written, oral and practical, and are held at the end of the courses. Candidates are required on the first occasion of presenting themselves for examination in either part to appear for all the subjects of that part. Candidates who fail to pass the entire examination in either part within a period of 12 months after first appearance are required to reappear for all the subjects. The University is included in the list of institutions whose courses of instruction in Tropical Medicine may be taken by officers on appointment to the Colonial Medical Services or during study-leave. Full particulars can be obtained from the Dean of the Faculty of Medicine.

English Conjoint Board.

The Board conducts an Examination three times a year for the D.T.M. and H. granted by the Royal Colleges. The regulations are at present under revision. Further particulars from the Secretary, Examination Hall, Queen-square, London, W.C.1.

DIPLOMA IN OPHTHALMIC MEDICINE.

Special diplomas in ophthalmic medicine and surgery are issued by two examining bodies.

University of Oxford.

The diploma in ophthalmology (D.O) is granted to registered medical practitioners after passing an examination, held annually in June, which is open to candidates who have pursued at Oxford a course of study in ophthalmology over a period of at least two months and who have attended a 12 months' recognised hospital course. Further information regarding these requirements may be obtained from the Dean of the School of Medicine.

English Conjoint Board.

The Conjoint Board grants the D.O.M.S. after an examination held in two parts, twice yearly in February and July. Part I. comprises anatomy and embryology of the visual apparatus, physiology of vision, and elementary optics. Part II. comprises optical defects, ophthalmic medicine and surgery, and pathology with special reference to ophthalmology. The examination in each case is written, oral, and practical or clinical. Candidates may only enter for Part II. on completion of a year of special study of ophthalmology after obtaining a registrable diploma or a Degree in Medicine and Surgery of a University recognised by the Board.

DIPLOMA IN MEDICAL RADIOLOGY AND ELECTROLOGY.

University of Cambridge.

The D.M.R.E. is open only to those who have held for at least one year a medical qualification approved by the Committee. The new regulations which came into operation in October, 1928, in some respects materially alter the scope of the Diploma. The course now occupies nine months, beginning in October. The first three months, which can be spent either in Cambridge or in London, are occupied with lectures and practical work in Physics in preparation for the examination for Part I. in January, and an introductory course in Radiology and Electrology. The second three months must be spent in London. The course, includes lectures and clinical instruction in Radiology and Electrology, with clinical practice in the radiological department of a hospital approved for that purpose by the Committee. The examination for Part II. is held in April. During the final three months a candidate must hold a clinical clerkship or similar appointment in a radiological department approved by the Committee, and must then present an exercise in the form of a critical report with notes upon six cases either in Radiology or in Electrology or in both these subjects, illustrating various methods of diagnosis or treatment. Under certain circumstances of previous experience, the third three months may be excused, but the standard of the exercise or thesis is expected to be considerably higher. A number of large provincial hospitals have been approved by the Commitee to take clinical assistants for this part of the course.

Further particulars as to courses and examinations may be obtained from G. Stead, M.A., Cavendish Laboratory, Cambridge, Secretary for the Diploma, or from Dr. A. E. Barclay, Department of Radiology, Medical School, Cambridge, or from Dr. Stanley Melville, British Institute of Radiology, 32, Welbeck-street, London, W. 1.

University of Liverpool.

Candidates before admission to the examination for the D.M.R.E. must possess a registrable qualification approved by the University in medicine and surgery, and must have attended courses of instruction in (*a*) physics (two terms), (*b*) (i.) radiology, and (ii.) electrology during six months in the X ray and electrotherapeutic department of a hospital or hospitals. An examination is held in March each year, the subjects being (*a*) physics, (*b*) radiology and electrology. Examination in either part may be taken separately. These courses commence during the first week in October. Application should be made to the Dean, Faculty of Medicine, the University of Liverpool.

University of Edinburgh.

Candidates for the Diploma in Radiology (D.R. Univ. Edin.) must be graduates in medicine and surgery of the University of Edinburgh or hold corresponding registrable degrees or qualification from some other licensing body. Candidates are not admitted to the examination for the Diploma until after the lapse of not less than one year from obtaining a registrable qualification, which qualification must be registered before admission to the Examination. The course of study begins in October and extends over a period of not less than three terms. The Examination, which is written, oral, and practical, is in two parts: (*a*) Physics, and (*b*) Radiology. The Examination is held twice yearly—viz., July and October. Full particulars may be obtained from the Dean of the Faculty of Medicine.

Radiology can be taken as the special subject in the examination for Membership of the Royal College of Physicians of Edinburgh, which means that an Honours standard has to be attained.

DIPLOMA IN LARYNGOLOGY AND OTOLOGY.

English Conjoint Board.

The Board grants the D.L.O. after an examination held in two parts, in June and December. Part I. comprises anatomy, embryology, and physiology of the ear, nose, pharynx, larynx, trachea and bronchi, and œsophagus. Part II. comprises the medicine, surgery, and pathology of the ear, nose, pharynx, larynx, trachea and bronchi, and œsophagus, and the recognition and use of special instruments and appliances. The examination in each case is written, oral, and practical or clinical. Candidates may only enter for Part II. on completion of one year of special study of the diseases of the ear, nose, pharynx, and larynx, after obtaining a registrable qualification, or a degree in medicine and surgery of a University recognised by the Board. The fee for admission to each part is 6 guineas.

DIPLOMA IN TUBERCULOUS DISEASES.

University of Wales.

The regulations governing the award of the diploma of T.D.D. prescribe that every candidate must have obtained a registrable qualification in Medicine, Surgery, and Midwifery for at least two years before he can be admitted to the examination. He must have held, for not less than 12 months, a resident medical or surgical appointment on the staff of a Tuberculosis Hospital or Sanatorium, or at an Orthopædic Institution providing not less than one hundred beds for cases of surgical tuberculosis; or shall satisfy the Faculty of Medicine that he has pursued a special study of Tuberculosis equivalent to the above for a period of not less than 12 months. Every candidate must have pursued a course of instruction in the epidemiology, pathology, and bacteriology of tuberculosis extending over one term in the Welsh National School of Medicine, or an equivalent course of instruction extending over at least the same period in an institution approved by the University for this purpose. The examination is held annually in the first week of June. Notice of candidature, together with the entrance fee of £10 10*s.*, and the necessary certificates, must be forwarded to the Registrar of the University, University Registry, Cathays Park, Cardiff, not later than May 1st.

The *Cecil Prosser Research Scholarship*, of the value of £250 for one year, is awarded triennially for research in Tuberculosis.

DIPLOMA IN BACTERIOLOGY.

University of London.

The University of London, grants an Academic Diploma in Bacteriology, the Course being open to (*a*) Graduates in Medicine, Science and Pharmacy of this or another approved University, whose previous training has, in the opinion of the University, fitted them to profit by the Course; and (*b*) registered medical practitioners and other students who, though not graduates, have obtained a qualification and undergone a previous training which, in the opinion of the University, has fitted them to profit by the Course.

A Course necessary to fulfil the regulations of this Diploma has been planned by the London School of Hygiene and Tropical Medicine, Keppel-street, London, W.C., and full particulars with regard to the Academic Diploma may be obtained from the Academic Registrar, University of London, South Kensington, S.W.

FEDERATION OF HEALTH RESORTS OF FRANCE.—A conference of American doctors is announced to be held at Vichy from August 25th to the 28th under the auspices of the Compagnie Fermière de Vichy. An interesting programme has been arranged in the course of which Dr. Durand-Fardel, the President of the Medical Society of Vichy, Dr. Piéry, Professor of Hydrology at Lyons, and Dr. Gustave Monod will discuss the hygienic amenities of Vichy. On the closing day Dr. Max Einhorn, of New York, a well-known authority on dietetics, will address the congress on certain aspects of therapeutic technique in connexion with digestive troubles. The congress will have ample opportunities of visiting the laboratories and installations of the Compagnie, while the visit will be interspersed with occasions of hospit

Dr. Robert Kells Library
Medical College

DENTAL SURGERY

TEACHING INSTITUTIONS IN DENTISTRY.

REGISTRATION on the Medical Register entitles a practitioner to practise as a dentist, although he cannot register as such without degree or licence in dentistry ; but few dental appointments at general or special hospitals or dispensaries are available save to those with a special diploma, and, until registered on the Dentist Register, no dental work under the Additional Benefit Scheme of the National Health Insurance Act can be undertaken.

The Examining Bodies in Dentistry which grant degrees and diplomas in the subject are as follows: Royal College of Surgeons of England, Royal College of Surgeons, Edinburgh, Royal Faculty of Physicians and Surgeons of Glasgow, Royal College of Surgeons in Ireland, and the following Universities: Birmingham, Bristol, Durham, Leeds, Liverpool, London, Manchester, Sheffield, St. Andrews, Dublin (Trinity College), Queen's University of Belfast, and the National University of Ireland. The student should apply to the secretaries of the various Conjoint Boards or to the Deans of the medical faculties or medical schools for a syllabus.

TEACHING INSTITUTIONS IN LONDON.

Royal Dental Hospital.

The Royal Dental Hospital of London, School of Dental Surgery, Leicester-square, is a school of the University of London. Women are admitted as students and are eligible for all hospital appointments and school prizes. The school provides the special dental education required by the University of London for the B.D.S. Degree and the Royal College of Surgeons for the Licence in Dental Surgery. The general part of the curriculum may be taken at any general hospital. The hospital is open from 9 A.M. to 6 P.M., there being one staff for the morning and another for the afternoon of each day. Pupils are received for the training in dental mechanics recognised by the curriculum. The instructors at the commencement of each session give a course of lectures on Operative Dental Surgery. The five house surgeoncies are held for four months each and are open to all qualified students. The lecturers, in addition to their lectures, give special demonstrations on the Microscopy of Dental Anatomy and Dental Surgery. The lecturer on Dental Mechanics also gives practical demonstrations in the laboratory. There is an Entrance Scholarship in Chemistry and Physics of the value of £25. One Scholarship in Dental Mechanics and Metallurgy, value £25. For full information as to scholarships and prizes, and other matters connected with the course, application should be made to the Dean.

University College Hospital Dental School.

This Hospital and School, situated at the corner of Great Portland and Devonshire-streets, W., has recently been thoroughly reorganised, and is now fully equipped with all the most modern appliances. Students are entered as students of University College Hospital, and, as such, attend the classes of Anatomy and Physiology in University College, which is a few minutes' walk from the Dental Department in Great Portland-street, hitherto known as the *National Dental Hospital*, the first Dental School to admit Women Students. Practical courses to comply with the R.C.S. curriculum are held. Clinical Lectures and Demonstrations are given, and each student on entering passes through a preliminary course under a demonstrator. A prospectus containing full information as to lectures, fees, and prizes may be had on application to the Sub-Dean for Dental Students, who attends at University College Hospital Medical School, University-street, W.C.1, on Wednesday mornings from 9.30 to 10.30, and at other times by appointment.

Guy's Hospital Dental School.

The work of the Dental Department begins daily at 9 A.M. both in the extraction rooms and in the conservation room. The Extraction Rooms: There is ample accommodation for both general and local anæsthetic extractions, together with waiting- and retiring-rooms. Patients are admitted between 8.45 and 9.30 A.M., and are seen by the dental surgeon for the day, the staff demonstrators, the dental house surgeons, and the dressers. The Conservation Room is open from 9 A.M. till 5 P.M. It affords accommodation for about 100 dental chairs, with the necessary equipment of the most modern type for the use of the Dressers, who, under the supervision of the Staff, perform the various operations of Dental Surgery. There is a separate room for denture patients affording accommodation for 15 chairs and a separate department for children with accommodation for 20 chairs. The Members of the staff attend every morning and afternoon to give demonstrations and otherwise assist students in their work in the Conservation Room and Prosthetic Laboratory. The Probationers' Laboratory is supervised by three of the staff demonstrators, and instruction is given in operative dentistry on a "mannikin" to students during their first three months of clinical study. Students in Dental Prosthetics are received, and a graded, systematic, and full course of instruction, extending over two years, is carried out under the supervision of the Director of the Prosthetic Laboratory, assisted by four demonstrators, a house surgeon, and seven mechanics.

Dental students have the opportunity of attending at this hospital the whole course of instruction required by the examining board for the B.D.S. Lond. or L.D.S. Eng.—viz., the complete course in dental prosthetics, the special lectures and practice of the Dental Department, and the general lectures and practice of the Medical School. Students who enter for a medical as well as a dental course are allowed to pursue their study of Dentistry during any period of their medical course most convenient to themselves without further charge.

Twelve house surgeons, 20 assistant house surgeons, and four student demonstrators of Dental Histology are appointed annually. The following appointments are held by students: Full surgeon's dresser, assistant surgeon's dresser, dresser in the children's department, casualty dresser, clerk to the anæsthetist, dresser in the gas extraction and local anæsthetic extraction rooms, and probationary dresser. For particulars as to scholarships and prizes, as well as all information, application should be made to the Dean of the Medical School, Guy's Hospital, London Bridge, S.E. 1.

King's College Hospital.

The Dental School is part of the Medical School of King's College Hospital, and was opened in November, 1923. The Dental Out-Patient Department of the Hospital is used for the performance of dental extractions. A large *Conservation* Room with provision for 40 dental chairs has been equipped. Smaller rooms are used for clinical teaching and administrative requirements, and a specially equipped laboratory for training in the art of dental mechanics. An X ray apparatus has been installed for special use in dental skiagraphy. A museum containing a large number of specimens illustrating oral, buccal, dental, and other diseases is available for teaching purposes. The library, lecture theatre, lecture rooms, common rooms, and the refreshment room are all available for the use of students. Courses of study, including practical work, are provided for the degree of Bachelor of Dental Surgery of the University of London, and for the Diploma in Dental Surgery of the Royal College of Surgeons of England. Special arrangements are made for those students who wish to take a medical degree or qualification in addition to a degree or diploma in Dental Surgery.

The following salaried appointments are open to qualified members of the School: Registrar, Resident House Surgeon, Non-Resident House Surgeon, and Tutors in Dental Mechanics, Operative Dental Surgery, and Dental Materia Medica.

Full particulars of the Dental School may be obtained on application to the Dean, or to the Secretary of the Medical School, King's College Hospital, Denmark Hill, London, S.E. 5.

London Hospital.

This school is a part of the London Hospital and Medical College, and is fully equipped on the most modern lines and with the latest appliances. It provides a complete curriculum in all subjects for the B.D.S. Degree and for the L.D.S. Diploma, and is admirably adapted for the purpose of teaching. The Conservation Room is well lighted and ventilated and fitted with pump chairs of the latest pattern; the fountain spittoons at many of the chairs have been specially designed. Each spittoon has attached to it a saliva ejector, hot and cold water, compressed air, gas and electric current also a swing bracket to carry the students' cabinet. Electric sterilisers are supplied in each department and motor engines where required. The School possesses, in addition to the Theatres, Laboratories, and Museums in the College, a special Museum of Dental Anatomy and Surgery, Operative Dentistry, Prosthetic and Extraction Rooms, an X Ray Room, and Laboratories for Practical Metallurgy and Prosthesis. A systematic course of instruction is arranged for pupils. The up-to-date Laboratory contains every modern apparatus, and is in charge of a skilled curator and his assistants. Entrance Scholarship: Francis Farmer Entrance Scholarship in Science, value £25; no age limit. Subjects: Chemistry and Physics. Prizes: The Harold Fink Prize in Operative Dental Surgery, value £8 8s.; the "London" Prize in Dental Prosthesis, value £5 5s. Prizes are also offered for competition at the end of each of the courses of lectures in the curriculum. Connected with the Medical College and Dental School are a Library, Athenæum, Clubs' Union, Dining Hall with moderate tariff, Students' Hostel, and an Athletic Ground. For full particulars as to Scholarships and Prizes, fees and course of study advised, apply to the Dean of the Medical School.

London (Royal Free Hospital) School of Medicine for Women.

Courses are arranged for women students for the study of dentistry and in preparation for the B.D.S. Degree of the University of London and the Licence in Dental Surgery of the Royal College of Surgeons of England, at the London (Royal Free Hospital) School of Medicine for Women, in conjunction with the Royal Dental Hospital, Leicester-square.

TEACHING INSTITUTIONS OUTSIDE LONDON.

Birmingham Dental Hospital.

Dean: Cyril Howkins, O.B.E., D.S.O., M.R.C.S., L.D.S. The Dental Hospital, Great Charles-street, has accommodation for 100 students. The equipment is in accordance with the most modern requirements for the efficient teaching and practice of Dental Surgery, including Radiology and a new department for Practical Pathology and Bacteriology. The hospital, both internally and externally is being renovated, and several departments are being reconstructed. The operations performed annually average 61,000, including gold and other fillings crowns, bridges, porcelain inlays, and injections for block and infiltration anæsthesia. The orthodontic department is one of the foremost in the country. The Prosthetic and Mechanical Department is large and well lighted and under a highly skilled instructor who is always present. Application for information as to fees and scholarships must be sent to the Dean of the Medical Faculty, Birmingham University, or the Dean of the Dental Hospital, Birmingham.

Leeds University School of Dentistry.

The School of Dentistry is adequately equipped to provide for the complete training of the dental student. It forms a part of the Leeds School of Medicine whilst the instruction in clinical and mechanical dentistry is carried out in the Dental Hospital. The School is now in occupation of a spacious new building especially designed to the requirements of modern dental teaching. The School is also the dental department of the General Infirmary, and its close association with the work of that institution ensures an adequate supply of clinical material, and enables a fuller insight into the position dental surgery holds in relation to general medicine and surgery, especially with regard to the major diseases and injuries of the head and neck. The courses of study are mainly designed to meet the requirements of the B.Ch.D. and L.D.S. Leeds, but every opportunity is afforded to students preparing for the degrees or diplomas of other licensing bodies. Full-time demonstrators give the instruction in clinical dental surgery, prosthetic dentistry, and mechanics, which is carried out under the supervision and direction of the Professor of Clinical Dental Surgery and members of the Honorary Staff. Special facilities are provided for instruction in Orthodontia, Dental Radiography, Local and General Anæsthetics. Prizes are offered for competition to pupils and students in their respective years of study. Communications should be addressed to the Warden, School of Dentistry, Leeds, from whom a prospectus may be obtained.

Dental Hospital of Manchester.

This hospital is in association for teaching purposes with the University of Manchester and the Royal Infirmary, and is in the centre of a very large population. Courses of study are provided to met the requirements of the various examining bodies, including those of the University of Manchester for the qualifications L.D.S. and B.D.S., and the L.D.S. of the Royal College of Surgeons of England. Clinical instruction is given in Dental Prosthetics, Operative Dentistry, Diagnosis and Extraction, Orthodontics, Dental Surgery, Radiography, and Anæsthetics by specially appointed Clinical Teachers.

All the courses of instruction are open to women students. Copies of the Prospectus will be forwarded on application to Mr. J. Hilditch Mathews, Dean.

Newcastle-upon-Tyne Dental Hospital and School.

This institution has recently become a component part of, and now constitutes the Dental Department in, the University of Durham College of Medicine. A new dental hospital, erected within the grounds of the Royal Victoria Infirmary and equipped with the most modern apparatus, is to be opened at the commencement of the forthcoming academic year, and in future it will be possible to undertake the whole of the dental curriculum (i.e., systematic lectures, dental and general hospital practice, together with the mechanical pupilage) at the College. The Dental Board of the United Kingdom will recognise the school for the purpose of granting its bursaries to students who are able to comply with the conditions laid down by the Board. The composition fees payable by dental students are £110 for all systematic lectures and laboratory work at the College for the B.D.S. (of £100 for the L.D.S.), £50 for dental hospital practice for B.D.S. (or £40 for L.D.S.), £21 for general hospital practice, and £80 for mechanical pupilage. A dental prospectus and any other information may be obtained from the Dean, University of Durham College of Medicine, Newcastle-upon-Tyne.

Devon and Exeter Dental Hospital.

The hospital at 24, Southernhay West, Exeter, is open on Mondays, Tuesdays, Wednesdays, Thursdays, Fridays, and Saturdays, and patients are admitted between the hours of 9.30 and 11 A.M. This hospital is being amalgamated with the Royal Devon and Exeter Hospital.

SCOTTISH TEACHING INSTITUTIONS.

Edinburgh Dental Hospital and School.

The Edinburgh Dental Hospital and School is located in spacious and well-equipped buildings at 30, 31, and 32, Chambers-street, and offers special advantages to dental students. A large and important extension of the existing buildings has now been opened. The General Courses required for the Dental Diploma may be taken in the Medical School of the Royal Colleges of Physicians and Surgeons or in the University schools. The general hospital attendance and clinical instruction are taken at the Royal Infirmary. The University, Medical Schools, and Royal Infirmary are within three minutes' walk of the Dental Hospital. The special courses are taken in the hospital. The Dental Hospital practice, extending over two years, affords a student ample opportunity for a full acquaintance with every branch of dentistry. The hospital admits a limited number of indentured pupils. They receive their instruction in Mechanical Dentistry concurrently with the general and special courses. A premium of 60 guineas is payable with each such pupil. The practice and lectures of the hospital are recognised by, and qualify for, all the Licensing Boards. Those students who desire to take a Medical and Surgical Diploma in addition to the L.D.S. have in this school admirable facilities for so doing. The triple qualification of the Royal College of Physicians and Surgeons of Edinburgh and the Royal Faculty of Physicians and Surgeons of Glasgow is recommended. The Higher Dental Diploma (H.D.D.) of the Royal College of Surgeons affords an opportunity of obtaining a higher qualification subsequent to registration. The Prospectus, with full information, may be obtained by application to the Dean or the Assistant Secretary.

Incorporated Glasgow Dental Hospital.

This hospital is located at 158, Renfrew-street, and 15, Dalhousie-street, Glasgow. The school is open to Men and Women Students, and Lectures are given on Dental Surgery, Operative Dental Surgery, Orthodontia, Dental Anatomy and Physiology, Dental Histology, Dental Mechanics, Crown and Bridge work, Dental Metallurgy, Dental Bacteriology, Radiology, Anæsthetics, and Dental Materia Medica. Lectures on general subjects required for Dentistry may be taken at the University or at one of the extra-mural schools where special provision is made for Dental Students. The new Dental Hospital and School will be open in October. The new Hospital will be equipped with all modern methods for teaching students.

Glasgow Royal Infirmary.

Dental Department: The following course in the curriculum can be taken at St. Mungo's College: Anatomy, six months; Practical Anatomy, nine months; Physiology, six months; Chemistry, six months; Practical Chemistry, three months; Surgery, six months; Medicine, six months; Materia Medica, three months. Clinical Medicine (three months) and Clinical Surgery (six months) are taken at the Royal Infirmary.

IRELAND.

Dental Hospital of Ireland.

All Dental Students who have passed their Second Dental Examination in the Royal College of Surgeons in Ireland (or an equivalent examination or examinations) are admissible to the Clinical Instruction of the Hospital. In addition to Clinical Instruction and Special Demonstrations, courses of lectures are given at the hospital on Dental Surgery and Pathology, Mechanical Dentistry, the Administration of Anæsthetics, Orthodontia, Dental Anatomy, and Dental Materia Medica, and instruction in Anæsthetics. The course in practical Dental Mechanics can be taken in the Hospital Laboratory. Further particulars can be obtained from the Dean, at Lincoln-place, Dublin.

THE SERVICES

ROYAL NAVAL MEDICAL SERVICE.

Surg. Lt. W. P. E. McIntyre to be Surg. Lt.-Comdr.

ROYAL NAVAL VOLUNTEER RESERVE.

The following appointments are notified: Surg. Lt. W. F. Lascelles to *Pembroke*, Surg. Sub-Lt. H. A. Lockhart to *Victory*, and Proby. Surg. Sub.-Lt. P. M. Coats to *Enterprise*.

ROYAL ARMY MEDICAL CORPS.

Maj. W. W. Pratt is placed on the half-pay list on account of ill-health.

Lt. (on prob.) A. Macdonald is restd. to the estabt.

The undermentioned to be Lts. (on prob.): T. M. R. Ahern, G. Herbert, R. Johnston, J. B. George, G. A. Kane, H. V. Tighe, W. B. F. Brennan, 2nd Lt. J. C. Barnetson (from Gen. List, T.A., Edinburgh, Univ. Contgt., O.T.C.), and J. K. Chappell

The undermentioned Lts. (on prob.), are secd. under the provisions of Art. 213, Royal Warrant for Pay and Promotion: T. M. R. Ahern and H. V. Tighe.

ARMY RESERVE OF OFFICERS.

Maj. C. W. Bowle to be Lt.-Col.

TERRITORIAL ARMY.

J. E. Foran (late Flight Lt. R.A.F. Med. Serv.) to be Lt.

ROYAL AIR FORCE.

Flight Lt. Edward Alexander Rice is transferred to the Reserve, Class D ii.

INDIAN MEDICAL SERVICE.

Lt. G. F. Condon to be Capt. (prov.).

The undermentioned Capts. (prov.) are confirmed in rank: T. C. Ramchandani, M. G. Kelly, T. C. Puri, H. W. Farrell, H. S. Waters, P. Shannon, and J. S. McMillan.

INFECTIOUS DISEASE

IN ENGLAND AND WALES DURING THE WEEK ENDED AUGUST 15TH, 1931.

Notifications.—The following cases of infectious disease were notified during the week:—Small-pox, 19 (last week 25); scarlet fever, 1146; diphtheria, 716; enteric fever, 64; pneumonia, 428; puerperal fever, 37; puerperal pyrexia, 111; cerebro-spinal fever, 34; acute poliomyelitis, 11; encephalitis lethargica, 10; continued fever, 1; dysentery, 3; ophthalmia neonatorum, 96. No case of cholera, plague or typhus fever was notified during the week.

The number of cases in the Infectious Hospitals of the London County Council on August 18th–19th was as follows: Small-pox, 35 under treatment, 2 under observation (last week 46 and 2 respectively); scarlet fever, 1136; diphtheria, 1399; enteric fever, 15; measles, 145; whooping-cough, 353; puerperal pyrexia, 39 (plus 7 babies); encephalitis lethargica, 212; poliomyelitis, 5; "other diseases," 131. At St. Margaret's Hospital there were 13 babies (plus 7 mothers) with ophthalmia neonatorum.

Deaths.—In the aggregate of great towns, including London, there was no death from small-pox, 2 (1) from enteric fever, 9 (2) from measles, 1 (1) from scarlet fever, 18 (7) from whooping-cough, 21 (2) from diphtheria, 50 (13) from diarrhœa and enteritis under two years, and 15 (2) from influenza. The figures in parentheses are those for London itself.

Two deaths from measles were reported from Wakefield, no more than 1 from any other large town. Liverpool reported 3 deaths from whooping-cough; Bradford, 3 deaths from diphtheria. Diarrhœa was credited with 6 deaths at Birmingham, 4 at Liverpool, and 3 at Bolton.

The number of stillbirths notified during the week was 280 (corresponding to a rate of 42 per 1000 births), including 47 in London.

PUBLIC HEALTH SERVICES

ANNUAL REPORTS OF MEDICAL OFFICERS OF HEALTH.

THE following are 1930 statistics of Edinburgh, Liverpool, and Nottingham :—

Name of district and estimated mid-year population.	Birth-rate.	Death-rates per 1000 of the population.					Death-rates per 1000 births.		
		All causes.	Tuberculosis.	Cancer.	Respiratory diseases with influenza.	Heart disease.	Infant and neonatal mortality.	Young child (1–5 yr.) mortality.	Maternal mortality from childbirth.
Edinburgh .. (425,951)*	17·2	14·2	0·99	1·68	2·2	2·3	82/32	46	8·1
Liverpool .. (879,657)†	21·5	12·8	1·40	1·23	2·5	1·4	82/33	40	4·0
Nottingham . (266,800)‡	17·0	12·8	1·14	1·44	2·2	2·6	75/—	32	3·7

Registered stillbirths per 100 live births: Edinburgh, 5·4; Liverpool, 4·1; and Nottingham, 4·7.

* R.-G. (Scotland) estimate. The Census 1931 shows it to be an underestimate by about 13,000.

† Local estimate for 1930, and about 24,000 in excess of Census figure (1931).

‡ R.-G. estimate for 1929, and about 2000 below the Census figure (1931).

Edinburgh.

Dr. John Guy, who succeeded Dr. William Robertson in September last, tells us that the recent census shows the population to have been underestimated by about 13,000. Except for diphtheria, the city was comparatively free from serious epidemics. During the past five years, and especially during the last two years, notifications of diphtheria have increased. In 1930 there were 1102 notifications with 71 deaths, a case-fatality of 6·4 per cent. Dr. W. T. Benson reports that 1086 cases were admitted to hospital, and that the type of the disease was more severe. Intubation was performed in 19 cases, of whom 6 died; tracheotomy in 9 cases, of whom 8 died; and intubation followed by tracheotomy in 8 cases, of whom 3 died. The severer type was shown by a paralysis rate of 7·1 per cent. In the 62 fatal cases, death occurred in 22 within 48 hours of admission. Suction treatment in suitable cases was an unqualified success, and the Electro-Atmos pump proved to be an ideal instrument for the purpose. Dr. Benson cannot understand why the practitioner delays the administration of antitoxin for the bacteriological result, when there are obvious and severe clinical manifestations.

Distressing cases are given to illustrate the existing housing shortage. As the result of a survey of the whole city, 5199 houses have been earmarked for demolition, in addition to those already scheduled. The three-years programme for the purpose of the Scottish Act is to build 1500 houses per annum, 750 of which are to be reserved for tenants dishoused in clearance areas. One result of the Local Government Act will be the amalgamation of the school medical service with the health department. For the treatment of the sick poor the transfer from the public assistance committee to the health department cannot be completed until certain hospital reorganisation has been carried out. Pilton hospital (120 beds) had already been transferred, and Craigleith hospital (250 beds) came under public health control on May 16th. The hospitals at Craiglockhart and Seafield remain under the care of the public assistance committee pending arrangements for separate administration. Dr. John Keay, medical superintendent of Bangour mental hospital, which has also been transferred to the Town Council, says 367 cases were admitted during the year, of which 24 per cent. were voluntary patients. The average number of occupied beds during 1930 was 1031, as compared with 982 in the previous year. Dr. Keay suggests that Edinburgh should have facilities for the treatment not only of mental disorders from the earliest appearance of symptoms, but also for functional types of nervous illness, which, untreated, are apt to drift along to a complete breakdown, and that the establishment of a nervous and mental clinic, with wards in one of the hospitals and an active social service department, would meet this need. Gogarburn certified institution at present accommodates 150 mental defectives, and extensions in progress will increase the accommodation to 500 beds.

In October, 1930, a combined inquiry as to the prevalence of tubercle bacilli in market milk by the health departments of Edinburgh, Glasgow, Aberdeen, and Dundee, assisted by the Hannah Institute, and coördinated by the department of health for Scotland, was begun. The inquiry will last for two years, and a uniform bacteriological technique has been agreed. Samples will be taken of raw milk as delivered by the farmer, of pasteurised milk, and of milk as retailed by the dairies. This scheme in Edinburgh will mean a large increase in the number of milk samples examined for tubercle. Two-thirds of the milk samples will be examined by the university and one-third by the veterinary department. The opportunity is also being taken of estimating the prevalence of *Bacillus abortus* in market milk, and towards the end of the year a systematic examination of the spleen and sublumbar glands of guinea-pigs inoculated under the tubercle scheme was instituted. Serums submitted for the Widal have also been tested for bacillus abortus. Two positive results, one in February and the other in November, were obtained. The patients were males, aged 32 and 20, respectively. Some of the symptoms resembled enteric, and the illnesses lasted 6 and 13 weeks, respectively. The disease appeared to have been contracted elsewhere than in Edinburgh. Both cases recovered. It is suggested that as the susceptibility in cattle increases with age the same may be true for man, and explain why children are so seldom affected when the comparative frequency of milk infection is taken into account.

The report of Dr. David Lees on the V.D. work raises many interesting points. During the last five years there has been a progressive decrease in cases of inherited syphilis under one year, attributed to the work of the antenatal treatment centres. Of 22 cases of ophthalmia neonatorum treated in hospital complete vision was restored except for the loss of vision in one eye in one child. This child was admitted to hospital 12 days after birth, when the eye was already irreparably damaged. Dr. Lees is not satisfied that the best results are being obtained either in the prevention or treatment of this disease. Vulvo-vaginitis cases in young children numbered 22, and in-patient hospital treatment is urged for this intractable condition, to prevent the infection spreading to other children. Most of the cases result from the children sleeping in the same bed as an infected parent. Dr. Lees finds, after reviewing the cases of syphilis treated during the last 10 years, only one case of neuro-syphilis after a full course of treatment. Intravenous injections of tryparsamide are used for neuro-syphilis, with striking effect, and malarial treatment is found to give good results. Of 45 cases of general paralysis treated by the latter method, over 30 per cent. are well, physically and mentally, and are at work. Although 80 per cent. of the patients remained under treatment until considered cured, the 20 per cent. of defaulters in 1930 represents 693 patients, many of whom are still infective. The follow-up by visiting nurses has produced good results in the case of the women, but the residue, who refused to return for treatment, constitute a careless and inconsiderate group who do not mind whether they spread disease or not. If there could be some further method of control of infected patients, Dr. Lees thinks the defaulter rate could be reduced to a negligible quantity.

Liverpool.

Dr. A. A. Mussen says the health of the city was most satisfactory during the year, notwithstanding a severe outbreak of diphtheria, which taxed the accommodation in the infectious hospitals to the full. There were 4023 cases with 236 deaths, a fatality-rate of 5·9 per cent. Nine cases of anthrax were treated at Fazakerley hospital with serum without recourse to surgical excision of the local lesion. There were 2 deaths, one of a tannery hand, who had been 5 days ill on admission, and the other of a dock labourer, who had been ill 3 days and was almost moribund on admission. There were 6 cases of psittacosis, 5 being residents in one institution. All recovered. Five were associated with the handling of a green Amazon parrot, which died. One case of undulant fever removed to hospital had been taken ill 2 days after returning from a holiday in Flintshire. The symptoms resembled typhoid fever.

During the last half of 1929 arrangements were made to anticipate the operation of the Local Government Act. A public assistance committee was formed, consisting of 60 members of the City Council and 30 coöpted from the West Derby guardians and persons interested in social work. On April 1st all the activities of the guardians were transferred to the public assistance committee, with the exception of functions under the Children Act, 1908, and the Vaccination Acts. The 11 institutions transferred have a total bed accommodation of 9892. As a preliminary measure to determining the best use for these institutions, all the hospitals are being administered by the city hospitals' committee on behalf of the public assistance committee. These formerly poor-law hospitals were in the habit of admitting non-notifiable infectious diseases from the county borough of Bootle and many townships round Liverpool, and this arrangement will be continued for the present. The districts of the 12 public vaccinators and of the 4 vaccination officers are also being continued as before.

The new city abattoir is rapidly nearing completion, and will be ready for occupation in September, 1931. The site is about 3 miles east of the Liverpool town hall, and has an area of 15 acres, with a further 4 acres to be acquired. A plan is included in the report. The buildings and equipment are arranged on the most hygienic lines, and Dr. Mussen draws attention to the bathing and washing arrangements and special clothes lockers provided for the slaughtermen, and also to the isolation slaughter-house block, which is to be used for the slaughter of any animal showing signs of disease or injury. All the available space has been taken up by the traders, and the trade estimate for the annual number of animals to be slaughtered is: 66,500 cattle, 47,200 calves, 586,300 sheep, and 108,200 swine. In addition, the carcasses of imported meats will much exceed in number the animals slaughtered. A new centre for estimating atmospheric pollution has been opened in a residential area at the Carnegie Welfare Building, and a comparison of the results with those obtained at the Netherfield-road centre in a smoky district shows that the total atmospheric pollution does not much exceed one half. The approximate demand for domestic fuel in Liverpool is 20,000 tons weekly, but the available supply of smokeless fuel is only about 1400 tons, so that unless the output of the smokeless fuel is greatly increased, or more progress made in the matter of gas and electric heating, the domestic smoke nuisance cannot improve. The firing of domestic chimney-flues is a common offence, and 2520 convictions were obtained by the police during 1930, as compared with 2320 in the previous year. There are only two boiler-plants working with pulverised fuel, and the difficulty previously experienced by the caking of the fuel, and the choking of the burner through the moisture content of the fuel, has now been overcome.

The number of inhabited houses in the city is 162,500. Up to the present 19,307 houses and 169 flats have been built by the City Council, and it is anticipated that 13,000 more houses will be built during the next five years. Progress has been made with two large unhealthy areas known as "Queen Anne-street" and "Gerard-street." The former involved 434 houses and a population of 2876. The Ministry's order made in November, 1928, was quashed in the King's Bench Court, but subsequently confirmed on appeal by the House of Lords, and the judgment given on March 23rd, 1931, is given in full, together with a plan of the area. The Gerard-street area is being dealt with as a clearance area under the 1930 Act, and the Minister of Health has now confirmed the compulsory purchase order. It involves 398 houses and a population of 3430. Of the 13,000 municipal houses included in the five-years programme, 3000 are to replace houses demolished in clearance and improvement areas and individual unfit houses.

Nottingham.

Dr. Cyril Banks shows by a table that Nottingham is well off for hospital facilities. The hospital for mental defectives, however, only provides for female patients, and male patients are accommodated in institutions in various parts of the county. Under the Local Government Act the health committee has been placed in charge of the hospital portion (842 beds) of Bagthorpe Institution. This hospital has been renamed the City Infirmary, but is still a poor-law institution, pending arrangements being made for its separation from the institution and the complete transfer. Until the subject has been more fully discussed the consultation with the representatives of the local voluntary hospitals remains in abeyance. In the meantime a medical superintendent has been appointed and a visiting staff, and every effort is being made to get the best use out of the hospital for the citizens. The new children's hospital, erected on an adjacent site before the boards of guardians relinquished office, was brought into use in the summer of 1930. The damage done by ophthalmia neonatorum was considerable. Of 31 notified cases, 26 were treated at home and 5 in hospital. There were 4 cases of impaired vision and one of total blindness.

An outstanding feature of the year's work was the renovation of insanitary property, made possible by the satisfactory coöperation of owners and agents. The majority of the houses at present being renovated are of the back-to-back type, of which there are nearly 4000, excluding the houses involved in the clearance areas represented during the year. The clearance areas so represented numbered 29, and included 2022 houses, with a population of 7297 persons. This clearance scheme will remove much of the insanitary property, and clear the central portion of the town of slums. Inhabited houses number 71,302, and the corporation own 8367. During 1930 the municipal houses erected numbered 2319. The provision of a public abattoir for Nottingham, says Dr. Banks, is long overdue, and instances are given of the importation of diseased beef into the city. The use of 4 of the 65 private slaughter-houses came to an end during the year.

Difficulties have arisen about the marking of eggs. In some cases the marked area of the shells has been over-stamped with the words "English new laid." In one case proceedings could not be taken, as the underlying marks had been so efficiently removed that the government laboratory was unable to say what the marks had been, and it could not be proved that the eggs were other than English, although the person concerned had been previously convicted for removing marks from imported eggs with acid.

SPECIAL ARTICLES

AN INVESTIGATION OF THE SPECTROPHOTOMETRIC ASPECTS OF THE BENDIEN TEST.

BY FRANK CAMPBELL SMITH, B.Sc. LOND., M.R.C.S.,
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IN 1931 Dr. Bendien wrote a book entitled "Spezifische Veränderungen des Blutserums; ein Beitrag zur serologischen Diagnose von Krebs und Tuberkulose."[1] In this book it is not definitely claimed that the alterations found in the serum of carcinomatous patients are of diagnostic value, but a method of examination of serum is described (partly chemical, partly spectrophotometric) which reveals changes said to be characteristic of cancer, tuberculosis, and other diseases. Claims have since been made, on the strength of tests supervised by Dr. Alfred Piney and reported in a statement issued to the press by the general secretary of the British Empire Cancer Campaign, that this method is a diagnostic test for carcinoma, giving positive results even in early cases.

Since the spectrophotometric part of this method is beyond the scope of ordinary laboratory work, involving the use of expensive apparatus and a considerable technical knowledge of physics, and since we have been using this apparatus for some six years, we decided, with the approval of the Medical Research Council, to investigate this aspect of Dr. Bendien's method.

We also had the advantage of the loan from Messrs. Adam Hilger, Ltd., of their most up-to-date form of instrument.

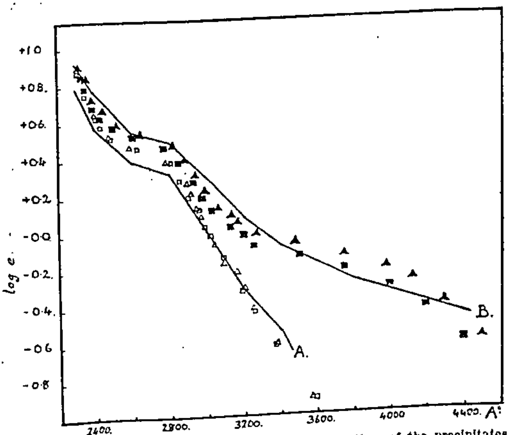
THE CHEMICAL TEST.

The method consists of two parts. In the first, samples of serum are mixed with a series of mixtures containing varying proportions of sodium vanadate and acetic acid numbered 1 to 20. With the sera of healthy persons precipitates should occur only with the mixture numbered 6 and with more alkaline mixtures, while the sera of persons suffering from carcinoma and various other diseases give precipitates with more acid mixtures also. We have performed this part of the method with the sera of 49 persons, including 12 normals and 15 suffering from carcinoma. Of the presumably normal sera only one gave a slight precipitate with mixture 5. All the sera of diseased persons, except one with sarcoma, gave a precipitate with mixture 5. We were not satisfied with the purity of the sodium vanadate used in the first 20 cases. The salt was therefore twice recrystallised. It was then found to contain 9 molecules of water of crystallisation; a decinormal solution contained the theoretical amount of vanadium as estimated by the method given by Treadwell and Hall.[2]

THE SPECTROPHOTOMETRIC TEST.

In the second part of the method, which concerns us more immediately, the precipitate, if any, formed with the mixture 5 is dissolved in sodium bicarbonate solution. The ultra-violet absorption curve of this solution is claimed to have a specific character in cases of carcinoma.

In order to make a so-called 1 per cent. solution of the precipitate for spectrophotometry Bendien filters off this precipitate by suction on a weighed glass filter, continues the suction for a certain time, weighs the filter again and dissolves the precipitate in 2 per cent. NaHCO$_3$, using 10 c.cm. for each 0·1 g. increase in weight. As a matter of fact over 90 per cent. of the increase in weight of the filter is due to retained water, most of which is retained in the disc, and varies greatly with the filter, the strength of suction, amount of precipitate, and temperature and humidity of the atmosphere. Consequently the concentration of the precipitate in the solution so prepared varies considerably. When the logarithm of the extinction coefficient of this so-called 1 per cent.



The effect of standing on the absorption curves of solutions of the precipitates formed with mixture 5. A. Bendien's curve for cancer. B. Bendien's curve for tuberculosis. Solid squares, solution 42 from cancer of breast, examined at once. Open squares, solution 42 from cancer of breast, examined after 36 hours. Solid triangles, solution 44 from rheumatic carditis, examined at once. Open triangles, solution 44 from rheumatic carditis, examined after 36 hours.

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[1] Bendien, S. G. T.: Spezifische Veränderungen des Blutserums. Jena: Gustav Fischer. 1931.

[2] Treadwell, F. P., and Hall, W. T.: Analytical Chemistry, London, 1924, p. 538.

solution is plotted against wave-length this variation in concentration has the effect of varying the height of the curve, without any variation in the nature of the precipitate; the shape and slope of the curve, however, depend on the nature of the precipitate and not on the concentration. Consequently only the shape and slope of Dr. Bendien's curves are significant; the heights are fortuitous. The curves may be compared by sliding them vertically up or down.

The curves A (cancer) and B (tuberculosis) in the accompanying figure are copied from Bendien's book. Curve A is characterised by a rapid fall of the absorption at 3400 A° and a steep rise (at an angle of about 50° on the scale used by Bendien); while in curve B absorption continues up to 4400 A° in the visible, and the slope is about 35°.

We have followed Bendien's procedure of weighing the moist precipitate and have plotted curves as he does. But we have also estimated nitrogen in the solutions and calculated and plotted the logarithms of the extinction coefficients of solutions containing 0·1 per cent. of protein. In these curves variations in height due to unknown and uncontrolled variations in concentration are avoided. Curves so obtained differ from those obtained by Bendien's method in height but are of the same shape and slope. In the main we shall consider curves based on protein concentration and shall only discuss those obtained after precipitation with the purified vanadate.

We have found that if the spectrophotometric examination of the solutions is done at once the curves obtained both with cancerous and non-cancerous cases resemble B in the figure, with absorption extending into the visible, as might be expected from the yellow colour of the solutions. The points in the figure shown by solid squares and triangles are those so obtained with the solutions from sera of cases of cancer of the breast and rheumatic carditis respectively. If, however, the solutions are allowed to stand they fade slowly and no longer absorb at the longer wave-lengths. The points shown in the figure by open squares and triangles were obtained from the same two solutions after they had stood 36 hours at room temperature partly shaded from light. Thus these two solutions, obtained from cases of cancer and rheumatic carditis, gave when fresh curves "typical of tuberculosis" and, after standing, curves "typical of carcinoma." The changes here shown would be the same if Bendien's method of plotting were used but would be less easy to see owing to differences in height of the curves.

This change was found to occur in every solution which was kept overnight. The change in the absorption curve is accelerated by light and heat. A definite change in two instances was found after standing at 20° C. from 4 P.M. to 7 P.M. on a very dull evening. Presumably yellow hexavanadic acid, formed on acidifying sodium vanadate and carried down with the protein precipitate, slowly changes back to colourless vanadate when made alkaline. The extinction coefficient of sodium vanadate is less than that of vanadic acid; hence the change in the absorption curves. Bendien makes no mention of this change nor of precautions to make sure that it has or has not taken place, such as standing for a given length of time or making immediate measurement. However he does state that "Der flache Verlauf der Kurven (the absorption curves of acidified vanadate solutions) zeigt, dass die Essigsäure-Vanadat-Lösung, die zur Ausflockung gebraucht wird, nicht imstande ist, den Charakter der Absorption der Eiweisslösung zu beeinflussen." Actually the absorption curve of the acidified vanadate solutions are not flat; and if they were they would influence the character of the absorption curves, since it is the logarithm of the absorption coefficient that Bendien plots, and log (a+b) does not equal log a+log b.

CONCLUSION.

We conclude that the absorption curves obtained by Dr. Bendien's method are the same in a variety of diseased conditions, including carcinoma, and that if the absorption is measured at once the curves resemble the tuberculosis curve of Dr. Bendien, changing in process of time to the carcinoma curve.

We feel confident that the spectrophotometric method applied to Dr. Bendien's solutions has no value in the diagnosis of cancer.

Our thanks are due to Messrs. Adam Hilger for the very generous loan of additional spectrophoto apparatus, and also to Messrs. Griffin and T for the loan of a chain balance.

BENDIEN'S WORK ON CANCER.

IN the letter from Dr. A. A. Miller, appearing this title on p. 427 of our last issue, the words "speci stabilisation" should have been printed as " labilisation," while in the sentence "Suspens 20 in all, of various strengths are now submitted to spectrophotometric examination" the word "strengths" should be "thicknesses."

We are informed by Messrs. William Heinemann (Medical Books), Ltd., that they are publishing translation of Dr. Bendien's book on "Specific in the Blood Serum." Dr. A. Piney will be translator.

MEDICAL NEWS

Society of Apothecaries of London.

At recent examinations the following candidates passed in the undermentioned subjects:—

Surgery.—L. F. Donnan, Queen's Univ., Belfast; A. K. Guha, Univ. of Manchester; and J. W. V. Sheldon, Guy's Hosp.

Medicine.—V. R. T. Baylis, Royal Free Hosp.; G. B. Carter, Univ. of Manchester; M. Ditton, Univ. of Heidelberg and Royal Free Hosp.; E. I. B. Hawes, St. George's Hosp.; S. Lokeez, St. Bart.'s Hosp.; L. R. C. Rose, Univ. of Manchester; D. N. Ryalls, Univ. of Sheffield; and E. S. St. John and J. W. V. Sheldon, Guy's Hosp.

Forensic Medicine.—G. B. Carter, Univ. of Manchester; H. W. Davies, St. Mary's Hosp.; B. Dayal, Univ. of Durham; J. M. Durr, Guy's and London Hosp.; S. Lokeez, St. Bart.'s Hosp.; and J. W. V. Sheldon, Guy's Hosp.

Midwifery.—O. A. P. Clark, Westminster Hosp.; J. M. Durr, Guy's and London Hosp.; B. N. Halder, Univ. of Durham; S. E. Paterson, Royal Colleges, Edinburgh; D. N. Ryalls, Univ. of Sheffield; and C. F. Vieyra, St. Mary's Hosp.

The following candidates, having completed the final examination, have been granted the diploma of the Society entitling them to practise medicine, surgery, and midwifery: G. B. Carter, O. A. P. Clark, A. K. Guha, B. N. Halder, E. I. B. Hawes, S. Lokeez, and E. S. St. John.

London Hospital.

The post-graduate course for former students will be held from Wednesday, Oct. 14th, to Saturday, the 17th. Further particulars may be had from Dr. W. Russell Brain, 105, Harley-street, W.1.—The annual dinner of past students will be held at the Trocadero Restaurant, Shaftesbury-avenue, W., on Thursday, Oct. 15th, at 7.30 P.M. The hon. secretaries are Mr. E. C. Lindsay and Mr. G. E. Neligan, 33, Wimpole-street, W. 1.—The annual dinner of the Dental Society will be held at the Trocadero Restaurant on Saturday, Nov. 28th, at 7 P.M. Further particulars may be had from the hon. secretary of the Society, London Hospital Medical College, E. 1.

Paying Patients at Edinburgh.

The corporation of Edinburgh is promoting a Provisional Order which gives power so to alter the charter of the Royal Infirmary as to enable certain patients to be charged a fee for their treatment. The Edinburgh trades and labour council has issued an "open letter" opposing the scheme as "unthinkable," on the grounds that an "absolute discretionary power makes the whole proposition profoundly suspect," and that in view of the fact that there are nearly 3000 names on the waiting-list there ought to be no reduction in the number of free beds.

OBITUARY

ROBERT MacNEIL BUCHANAN, M.B., F.R.F.P.S. Glasg.

Dr. R. M. Buchanan, who died at his home in Glasgow on August 15th after a long illness, was the first city bacteriologist to be appointed by the corporation of Glasgow, and was president of the Royal Faculty of Physicians and Surgeons in 1925.

DR. BUCHANAN.

[Photograph by Lafayette.

Born in 1861, near Drymen, overlooking Loch Lomond, he was the son of John Buchanan, a farmer, and from early environment acquired his bent towards comparative pathology. At first it seemed that this predilection was to be wasted, for after leaving the Glasgow High School he went into business, and rose to be Spanish book-keeper in a well-known firm. But his scientific ambitions remained. He extended his knowledge by attending classes in French, Spanish, and chemistry, and began the study of medicine at the age of 23. During his undergraduate career he attracted the attention of Joseph Coats, who then occupied the chair of pathology, and to whom he ultimately became assistant, and on graduation in 1888 he was awarded the Foulis memorial scholarship, which enabled him to proceed to Germany, where he studied pathology and bacteriology at Frankfort and Berlin under Weigert and Koch. This opportunity determined his future career along congenial lines. Returning from abroad, he delivered a course of University lectures, and about 1892 was appointed the first lecturer on bacteriology to the University of Glasgow, as well as first assistant to the professor of pathology. At this time the important part played by bacteria in the causation of disease was still largely unknown, and the training of a student comprised six lectures on bacteriology. Buchanan combined his pathological work with appointments as physician to the Royal Hospital for Sick Children, and the Western Infirmary, and from 1895 occupied the chair of medical jurisprudence and hygiene in Anderson's Medical College. Here he established the West of Scotland Clinical Research Association, an organisation which still exists, although much of the work it was intended to perform is now carried out in the laboratories of the voluntary hospitals of the city and in those of the corporation.

In 1899 Dr. Buchanan gave up all these posts to become city bacteriologist. He began in a single room fitted up for the purpose, with the use of another room in the tower for the making of media required for the cultivation of bacteria; but the growth of applied bacteriology soon caused the department to assume a more and more prominent place in public health and prevention of disease. One of his first important duties was in connexion with the outbreak of plague in 1900–1901, when he was associated with the professor of pathology in discovering, after long and tedious search, aided by inductive reasoning, the source of plague in the rats which infested a particular area of the city. He himself demonstrated the presence of the plague bacillus in the rat-flea, and was thus able to assist in coping with the spread of the disease. It is recorded that he took the extreme risk of performing the necessary post-mortems without the aid of gloves, which were of so coarse a texture as to hamper the delicate manipulations necessary. Another service was the eradication of glanders from the horses of the tramway department. But these are merely outstanding examples; the laboratory was called upon to deal with many other epidemics, including the outbreak of cerebro-spinal fever in 1906, and nowadays performs a great variety of routine investigations.

One of the chief features of Dr. Buchanan's activities was his interest in comparative pathology. He made it manifest in 1922 that much gain could be expected from the correlation of processes of diseases as they are seen in man and in the lower forms of life. His interests in this respect led him into such questions as the diseases associated with the vegetable and animal world, diseases of great economic importance, such as the blights affecting various fruits, and the diseases of the food-stuffs of our daily consumption—the potato, the currant, the tomato, the apple, and other vegetable products. He also showed for many years a strong liking for the study of insects. This attracted him both for its own sake and because many insects are destructive agents and give rise to serious economic loss. His advice was commonly sought from all over the country with regard to their identification, their habits, and the methods to be adopted for their extermination. For a number of years he had been greatly interested in the causation of grass sickness in horses, because of its similarity to encephalitis in man. The museum which he instituted in the laboratory has proved of great value to sanitarians, and of unfailing interest to visitors from among the general public.

On his election as president of the Royal Faculty of Physicians and Surgeons of Glasgow in 1925, Dr. Buchanan served with distinction for two years, during which he was called upon to organise the celebrations in connexion with the Lister centenary. He retired from the service of the corporation of Glasgow in November of last year. In the words of Dr. A. S. M. Macgregor, to whom we are indebted for many of these details, "his services to the city, his love for his work, and the prominent position he occupied by virtue both of his office and of the universal esteem in which he was held by his fellows, are a measure of the loss which the city has sustained by his death. He was a man of charming personality, and ever willing to assist his younger colleagues."

Dr. Buchanan married the daughter of Mr. John Neilson, Killearn, and she survives him. Their son is a member of the medical profession.

THE LATE GROUP-CAPTAIN MARTIN FLACK.

WE have received from the Air Ministry the following account of Group-Captain Flack's distinguished work in connexion with the Royal Air Force, in supplement to the obituary notice which we published last week:—

"In the early part of the war Group-Captain Flack was lent to the Army, and with Dr. Mervyn Gordon did valuable work in combating the cerebrospinal fever epidemics, and later Sir Walter Fletcher recommended him to the Services Medical Advisory Board to investigate the medical requirements of aviation. As a result he was gazetted as Lieutenant-Colonel, R.A.M.C., and, on the formation of the Royal Air Force Medical Service, as Wing Commander and Director of Medical Research.

"It is no exaggeration to say that the simple system of physiological tests evolved after long practical experiments by Flack has played a fundamental part in aviation medical standards in almost every country to-day. The whole examination of a pilot was expressly designed so that it could be carried out in peace or war with apparatus that an ordinary large suitcase can contain. With sound foresight and judgment Flack decided that the flying personnel should set the standards on which the various grades of pilots were assessed, so he based them on the averaged results of large numbers of pilots sent from their units for examination classed as 'super,' 'average,' and 'borderline,' the absolute rejects being obtained from those who had broken down under the strains imposed by aviation and fighting. These standards and the physiological tests have survived with only very slight modifications to the present day, and have proved their accuracy and worth under varying conditions all over the world. Not only are they of the greatest value in the selection and subsequent care of pilots, both service and civil, but they are the best method which has yet been evolved for detecting what Sir James Mackenzie described as the 'pre-disease state,' and in ordinary life have been utilised for researches into the medical problems of industrial conditions.

"After the war he served as a valuable member of many committees which dealt with aviation and allied subjects, was Milroy Lecturer in 1921, examined at Oxford University, and, in addition to the duties of Director of Medical Research in the Royal Air Force, commanded the Central Medical Establishment. In spite of these many activities, he found time to carry out investigation into the problems of oxygen and high flying, sea and air sickness, comfort in air travel, and other subjects. He was promoted to Group-Captain in 1923.

"The death of Martin Flack has caused an irreparable loss to both service and civil aviation, as there is no one else to replace his unique experience of the medical problems of flying, gained not only from his personal knowledge, but also from the close contact he had maintained from the earliest days with scientists in other countries who were devoting themselves to the same subject."

THE MILROY LECTURES.

Group-Captain Flack's Milroy Lectures, on respiratory efficiency in health and disease, were received by the medical profession as a highly valuable contribution to physiological knowledge on a subject of great practical importance. He raised the whole question of physical efficiency tests, and the value of special physical training, his views resulting from investigations undertaken in the course of his duties in connexion with the Royal Air Force Medical Service. His observations were pertinent, also, to the question of the comparative value of gymnastic exercises and outdoor games, and went to prove that success in respiratory tests connotes general good health, while failure to reach certain standards may imply unfitness. The lecturer described the system of routine tests for vital capacity and endurance which he had followed in arriving at his conclusions, and detailed a system of ten exercises aimed to develop circulatory and respiratory efficiency, an instructor attending the delivery of this part of the lectures in order to demonstrate the technique. The lectures were published in full in THE LANCET (vol. ii., 1921, pp. 593, 637, 693, 741).

ALBERT ALFRED TINDALL,

PROPRIETOR OF "THE MEDICAL PRESS AND CIRCULAR."

THE death on August 21st is announced of Mr. Albert Alfred Tindall, sen., principal of the firm of Baillière, Tindall and Cox, the well-known and long-established publishers.

Albert Tindall was born on Nov. 21st, 1840, being at the time of his death well advanced in his 91st year. He was the son of Mr. S. Tindall, of Brede, near Hastings, was educated privately, and came to London as a commercial clerk. He got an introduction to the well-known ophthalmologist, Dr. Archibald Jacob, of Dublin, who was the proprietor of the *Medical Press*, which then circulated largely in Ireland, and of an English medical journal, *The Medical Circular*. In the meantime Tindall had become the proprietor of a publishing business, and in 1866 he took over the publication of Dr. Jacob's two weekly papers, amalgamating them under the title of *The Medical Press and Circular*. Of this journal he eventually became the sole proprietor, and his general management of it was continued without a break till the commencement of his short and final illness—a period of no less than 65 years. The firm of Baillière, Tindall and Cox was founded by Tindall in 1870, having its origin in the union of a branch of the well-known firm of Baillière et Cie, in Paris, with the firm of Tindall and Cox, and of this business Albert Tindall became the enterprising head, and the list of its publications speaks for its standards and progress. For some time now his son, Mr. A. A. Tindall, jun., has had the reins of government, though the father supervised the issue of *The Medical Press and Circular*.

During his long life Albert Tindall became well known personally to a very large number of people, and in the district where his business lay his was a familiar figure, his upright carriage and alert movements giving a flattering denial to his real age. He had for many years been deaf, but though cut off in this way from much social intercourse, he kept in close touch with personal friends, and his loss will be widely felt.

Mr. Albert Tindall was twice married. He married first, in 1873, a daughter of the late Mr. J. S. Simson, of Deptford, a timber merchant and director of the Surrey Commercial Docks, and secondly, in 1890, a daughter of Sir William Bower-Smythe, of Hill Hall, Essex. He leaves a widow, one son, Mr. A. A. Tindall, jun., and three daughters. A younger son was killed in the war, while the eldest daughter is the wife of Dr. Arthur Giles, the well-known obstetrician.

MR. CHARLES RICHARD HEWITT, who died last week in a nursing home at Ealing, at the age of 61, was well known in London as a medical librarian. After 22 years service he became in 1907 joint librarian of the Royal Society of Medicine, taking a large part in the rearrangement of the several libraries of the amalgamated institutions. In 1919 he accepted an invitation from the League of Red Cross Societies to organise a public health library and registry at Geneva, and two years later he undertook for Messrs. William Heinemann, Ltd., the compilation of the *Medical Year Book*. Since 1925 he had been chief librarian of the research library which forms part of the Wellcome Historical Medical Museum. At different times he undertook responsibility for the medical libraries at University College and Guy's Hospital, and supplied the Royal Commission on Tuberculosis with references to all the periodical literature on a vast subject. Personal contact with most of the distinguished physicians and surgeons of his day qualified him to contribute a number of biographies to "Men and Women of the Time" and contemporary journals.

Medical Diary

Information to be included in this column should reach us in proper form on Tuesday, and cannot appear if it reaches us later than the first post on Wednesday morning.

LECTURES, ADDRESSES, DEMONSTRATIONS, &c.

ST. MARK'S HOSPITAL, City-road, E.C.

THURSDAY, Sept. 3rd.—4.30 P.M., Dr. J. K. Hasler: Spinal Anæsthesia.

Appointments

DAVIDSON, J. F., M.B., Ch.B. Aberd., D.P.H., has been appointed County M.O.H. and School M.O.H. for West Suffolk.

JONES, A. T., L.R.C.P. Lond., M.R.C.S., Certifying Surgeon under the Factory Acts for Carmarthen.

Vacancies

For further information refer to the Advertisement columns.

Albert Dock Hospital, Connaught-road, E.—Res. M.O. At rate of £110.

Altrincham, General Hospital.—Jun. H.S. At rate of £120.

Ashton-under-Lyne District Infirmary.—Res. Surg. O. £200.

Barrow-in-Furness, North Lonsdale Hospital.—H.S. £175.

Beckenham, Kent, Bethlem Hospital, Eden Park.—Locum Tenens M.O. 7 gns. per week.

Bedford County Hospital.—Asst. H.S. At rate of £130.

Birmigham and Midland Eye Hospital, Church-street.—H.S. £110.

Blackburn County Borough.—Asst. School M.O., &c. £600.

Bootle General Hospital, near Liverpool.—Cas. O. and two H.S.'s. All at rate of £150.

Brighton, New Sussex Hospital for Women and Children.—H.P. At rate of £100. Also Hon. Asst. Ophth. Surg.

Bristol City and County Mental Hospital.—Fourth Asst. M.O. £350.

Bristol Eye Hospital.—Anæsthetist. Also Res. H.S. £150.

Bristol Royal Infirmary.—H.P. £60.

Carnarvonshire C. C.—Deputy M.O.H. and Asst. School M.O. £700.

Cambridge, Addenbrooke's Hospital.—Two H.S.'s. Also Res. Anæsthetist and Emergency Officer. All at rate of £130.

Cancer Hospital, Fulham-road, S.W.—H.S. At rate of £100.

Cardiff Royal Infirmary.—H.P. and H.S. Each at rate of £50.

Connaught Hospital, Walthamstow, E.—Sen. Res. H.S. At rate of £150.

Coventry and Warwickshire Hospital.—Two Res. H.S.'s. Each £125.

Croydon General Hospital.—Hon. Surgeon for Ear, Nose, and Throat Dept.

Cumberland, Blencathra Sanatorium.—Asst. to Med. Supt. £300.

Derby, Derbyshire Royal Infirmary.—Ophth. H.S. £150.

Dreadnought Hospital, Greenwich.—H.P. and H.S. Each at rate of £110.

Dudley, Guest Hospital.—H.S. £170–£200.

East Ham Memorial Hospital, Shrewsbury-road, E.—H.P. At rate of £150. Also H.S. to Special Depts. and Cas. O. Each at rate of £120.

Edinburgh Royal Infirmary.—Clin. Assts. for Ear, Nose and Throat Department.

Great Yarmouth General Hospital.—H.S. £140.

Harrogate General Hospital.—H.P. At rate of £150.

Harrogate Infirmary.—Jun. H.S. At rate of £125.

Harrow-on-the-Hill, Harrow and Wealdstone Hospital.—Res. M.O. At rate of 140 gns.

Hospital for Tropical Diseases, Endsleigh-gardens, W.C.—H.P. At rate of £150.

Hove, Lady Chichester Hospital.—Jun. H.P. At rate of £50.

Hull, Corporation of Kingston-upon-Hull and Hull and Goole Port Sanitary Authority.—Asst. M.O.H. £600.

Hull Royal Infirmary.—Third H.S. for Parent Institution. £150. Also H.P. Sutton Branch Hospital. £160.

Leeds City.—Chief Asst. M.O.H. £900.

Leicester Royal Infirmary.—H.P. and H.S.'s. Also Cas. H.S. All £125.

Liverpool Eye and Ear Infirmary, Myrtle-street.—H.S. to Ophth. Dept. £120.

Liverpool Open Air Hospital for Children, Leasowe.—Jun. Res. M.O. £200.

London Temperance Hospital, Hampstead-road, N.W.—H.P. At rate of £100.

Maidstone, Kent County Ophthalmic and Aural Hospital.—H.S. At rate of £200.

Manchester, Northern Hospital for Women and Children.—Sen. H.S. and Jun. H.S. £130 and £100 respectively.

Manchester Royal Children's Hospital, Pendlebury.—Two Asst. M.O.'s for Out-patients' Dept. Each at rate of £150. Also Res. M.O. At rate of £125.

Manchester Royal Eye Hospital.—Jun. H.S. £120.

Manchester Royal Infirmary.—Technical Asst. for Clinical Lab. Work. £200.

Manchester and Salford Hospital for Skin Diseases.—H.S. At rate of £100.

Margate Royal Sea Bathing Hospital for Surgical Tuberculosis.—H.S. At rate of £200.

Middlesex Hospital, W.—Dental H.S. At rate of £200.

Miller General Hospital, Greenwich, S.E.—Cas. O. At rate of £150. Also H.P. At rate of £125.

National Hospital for Diseases of the Heart, Westmoreland-street, Marylebone, N.W.—Res. M.O. Also Out-patient M.O. At rate of £150 and £125 respectively.

Newcastle-upon-Tyne, Hospital for Sick Children.—H.P. and Sen. and Jun. H.S.'s. All at rate of £100.

Northampton General Hospital.—H.P. and Four H.S.'s. Each at rate of £150. Also Res. Dresser. £10 for six months.

Norwich, Norfolk and Norwich Hospital.—H.S. and H.P. Each at the rate of £120.

Nottingham General Dispensary, Broad-street.—Res. Surg. £250.

Oldham, Boundary Park Municipal Hospital.—Res. Asst. M.O. £200.

Princess Louise Kensington Hospital for Children, St. Quintin-avenue, Kensington, W.—H.P. At rate of £100.

Queen's Hospital for Children, Hackney-road, E.—Asst. Surgeon.

Richmond Royal Hospital, Surrey.—Jun. H.S. At rate of £100.

Rochester, St. Bartholomew's Hospital.—H.P. At rate of £175.

Royal National Orthopædic Hospital, 234, Great Portland-street, W.—Two H.S.'s Each at rate of £150. Also H.S. for County Branch, Brockley Hill, Stanmore. At rate of £150.

Royal Waterloo Hospital for Children and Women, Waterloo-road, S.E.—Hon. Clin. Asst.

St. Peter's Hospital for Stone, &c., Henrietta-street, Covent Garden, W.C.—H.S. At rate of £75.

Salford City Education Committee.—Asst. School M.O. £520.

Salisbury, General Infirmary.—H.P. £150.

Sheffield Royal Hospital.—Ophth. H.S. Also Anæsthetist. £120 and £80 respectively.

Sheffield Royal Infirmary.—Asst. Aural and Ophth. H.S. and H.S. and Second Asst. Cas. O. Each at rate of £80.

Shrewsbury, Royal Salop Infirmary.—Cas. O. and Res. Anæsthetist. At rate of £160.

Sidcup, Kent, Queen Mary's Hospital.—Asst. M.O. £250.

Southampton, Children's Hospital and Dispensary for Women.—Res. M.O. At rate of £100.

South Eastern Hospital for Children, Sydenham, S.E.—Asst. Res. M.O. At rate of £100.

Stafford, Staffordshire General Infirmary.—H.S. £200.

Stockport Infirmary.—H.P. £175.

Swansea General and Eye Hospital.—H.P. £150.

Taunton and Somerset Hospital.—Sen. H.S. £150.

Torquay, Torbay Hospital.—H.P. and H.S. Each £175.

Wakefield, Clayton Hospital.—H.S. At rate of £200.

West Bromwich and District General Hospital.—H.P. At rate of £200.

West London Hospital, Hammersmith-road, W.—Res. Asst. S. £200. Also H.P., H.S.'s, and Res. Anæsthetist. All at rate of £100.

Weston-super-Mare General Hospital.—Res. H.S. £150.

Wigan, Royal Albert Edward Infirmary and Dispensary.—H.S. At rate of £150.

Winchester, Royal Hampshire County Hospital.—H.S. At rate of £100.

Worcester County and City Mental Hospital, Powick.—Jun. Asst. M.O. £350.

York, City Mental Hospital, Fulford.—Asst. M.O. £500.

Births, Marriages, and Deaths

BIRTHS.

HUME.—On August 20th, 1931, at Wildwood-road, N.W., to Marjorie, the wife of J. Basil Hume, M.S., F.R.C.S.—a daughter (Gillian Mary).

LANDER.—On August 20th, at Salisbury-terrace, Devonport, the wife of O. Ll. Lander, M.R.C.S., L.R.C.P., of a son.

DEATHS.

HALES.—On August 20th, at Holt, Norfolk, Robert Turner Hales, M.D., aged 77 years.

LISTER.—Suddenly on August 18th, at his residence, Almeston-road, Bath, Herbert Shaw Lister, M.B., Ch.B. Vict., M.R.C.S. Eng., L.R.C.P. Lond., beloved husband of Elizabeth Lister, aged 55 years.

STEVENSON.—On August 19th, at Temple Sowerby, Louis Edgar Stevenson, B.A., M.B., B.C. Camb., aged 68 years.

N.B.—A fee of 7s. 6d. is charged for the insertion of Notices of Births Marriages and Deaths.

EXTENSION OF YOKER HOSPITAL.—On the recommendation of the Renfrew and Clydebank joint hospital board, the Clydebank town council has decided considerably to enlarge the Blawarthill Hospital at Yoker. The plans include the provision of a new nurses' home, two wards of 24 beds, an observation ward of 16 beds, and a theatre. The cost, exclusive of alterations to the existing administration blocks, will be £57,000.

MOTOR ACCIDENT CASES AT ADDENBROOKE'S HOSPITAL.—During the second quarter of the present year Addenbrooke's Hospital, Cambridge, received 52 persons injured by motor vehicles, of whom 23 were admitted to the wards. Two died within 24 hours, 15 were discharged after treatment, and six remained at the end of the quarter. The number of bed-days occupied was 326, and the estimated cost £133, towards which one donation of two guineas was received.

NOTES, COMMENTS, AND ABSTRACTS

FACTORY GIRLS' HOLIDAYS.

THE following letter reaches us from the Factory Girls' Country Holiday Fund:—

"At this time, when 'all the world' (as we say) is making holiday or preparing to do so, we hope that that they will spare something for that considerable remainder which cannot afford a holiday, or not on a sufficient scale. In particular, we ask them to remember once more, as they have in former years, the Factory Girls' Country Holiday Fund. Last year this fund arranged 1250 weeks of holiday for 1030 women and girls at a cost, including travelling, of £1630, of which sum more than one-third was contributed by the holiday-makers themselves. We would call special attention to this last point. Those who give to this fund have assurance, not merely that the money they give will be well spent, but also that it will encourage the wise spending of much other money, the hard-earned savings of the girls themselves, so that every pound they give will in effect provide a full week's holiday for a working woman. This is surely a good investment from a strictly financial point of view; and if anyone has other doubts, these can soon be settled by a visit to headquarters during the holiday season. The eager and excited crowds alone will tell him much, and a comparison between the group that is ready to go off and the group that has just come back will tell him the rest. Lastly, the subscriber may be assured that the fund is in the hands of careful and competent administrators, who make every effort to secure that girls are helped only so far as they cannot help themselves—and that they are encouraged throughout the year, by means of saving-cards and in other ways, to make the most of their ability to help themselves. Even in these difficult times we hope that support will be forthcoming generously and promptly for this work. Subscriptions and donations will be thankfully received and acknowledged by the hon. treasurer, Mrs. Slater, or Miss Mary Canney, 75, Lamb's Conduit-street, London, W.C.1."

The appeal is signed by the Countess of Sandwich, Mrs. Creighton, Miss Lilian Braithwaite, Dr. Octavia Lewin, the Very Rev. J. H. Hertz (Chief Rabbi), Prof. J. L. Stocks, Mr. J. F. Green (Chairman of Executive), and Mrs. Slater.

METHYLATED SPIRIT DRINKING.

THE Commissioner of Police of the Metropolis, in his report for 1930, records a decrease in convictions for drunkenness attributable to the drinking of methylated spirits; the convictions numbered 32 (27 males and 5 females), as against 45 in the previous year. On the other hand, the Licensing Statistics for the whole of England and Wales, recently published by the Home Office (Cmd. 3928, price 3*s.*) show an increase of 16·38 per cent. in 1930; the total was 476 (336 males and 140 females), against 409 (288 males and 121 females) in the previous year. Figures of these convictions have been collected for England and Wales since 1920; the annual average since then is 463. Details of the geographical distribution of the convictions show that methylated spirit drinking is widely scattered. Liverpool heads the list with an outstanding total of 74—more than double the total for the metropolitan area. Cardiff has 23, Hull and Manchester 14 each, Leeds 13, and Birmingham 10. Normally, as the gross totals indicate, the convictions of men substantially outnumber those of women. Yet at Liverpool 64 women are convicted, as against 10 men, and at Manchester 10 women, as against 4 men. Study of the detailed figures produces rather surprising results. We find 23 cases at Cardiff, but only one at Swansea, nine in the small borough of Caernarvon, but only three at Plymouth or Sunderland, and only two at Portsmouth or Southampton. Winchester and Henley-on-Thames are found on the same mark as Plymouth; Exeter, Cheltenham, and Bury St. Edmunds on the same mark as Portsmouth. Although at Trowbridge, in Wiltshire, three out of the four convictions for drunkenness in 1930 are ascribed to methylated spirit drinking, it is proper to remember—as the introduction to the Licensing Statistics points out—that the total of convictions attributable to methylated spirits continues to be trifling as compared with the total of convictions for drunkenness. The latter figure amounted to 53,080 in 1930, as compared with 51,966 for 1929. The increase (2·14 per cent.) is small, but this is the first time since 1924 that the total has shown an increase.

PRIMARY CARCINOMA OF FALLOPIAN TUBE.

J. Rabinovitch and J. D. Horton, who report a case[1] under their observation at the Missouri Baptist Hospital, remark that primary growths of the Fallopian tube are not very common, and owing to their great similarity to other pelvic conditions are seldom recognised before operation and examination of the specimen. The condition is usually seen in persons at or past the menopause and its true nature is apt to be mistaken owing to the frequency of secondary inflammatory changes. The commonest symptoms are watery or sero-sanguineous vaginal discharge, with or without abdominal pain. Both the pain and the discharge may vary in character and severity in different people or in the same person at different times. According to the size and position of the tumour in the pelvis there may be urinary or intestinal disturbances, such as frequent or urgent micturition or constipation. Marked loss of weight and cachexia are seldom observed, but under-nourishment and anæmia are not unusual. The size of the tumour varies from that of the little finger to that of a large mass filling the abdomen. The growth is fixed or freely movable according to the amount of inflammatory changes. The middle or distal third of the tube is the commonest site for the tumour, which may be unilateral or bilateral. The commonest histological varieties are the papillary and papillary alveolar, various modifications of these two patterns being encountered in different tumours.

Rabinovitch and Horton's case was in a woman, aged 55, who had reached the menopause five years previously. For the last two years she had had a watery vaginal discharge which had become more profuse and continuous during the past five months and had become sanguineous during the last three weeks. The uterus was small and retroverted and the adnexa were not palpable. A diagnosis of malignant disease of the uterus was made and laparotomy performed. The uterus, ovaries, and right Fallopian tube appeared normal, but the left tube was enlarged at its distal end. Although its gross appearance was indistinguishable from a chronic inflammatory process, the limitation of the lesion to one portion of the tube suggested malignancy and panhysterectomy was performed. No histological abnormalities were found in the uterus, ovaries, or right Fallopian tube, but sections of the left tube showed the appearance of a papillary carcinoma.

The issue of the case is not recorded.

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[1] Amer. Jour. Obst. and Gyn., May, 1931, p. 689.

NEW SKIPTON HOSPITAL.—Last week six foundation-stones of the new Skipton and District Hospital at Whinfield were laid by people closely connected with hospital work in the district. The buildings, which will cost over £13,000, will be opened free of debt, and there is an endowment fund of about £12,000.

FOREIGN DECORATIONS.—The King has given to the undermentioned gentlemen licence and authority to wear the decorations mentioned: to Dr. Theodore Dyke Acland (a British Official in the service of the Soudan Government) and Dr. Douglas Erith Derry the insignia of the second class of the Order of the Nile, and to Dr. Salvator Michael Vassalo the insignia of the fourth class of the Order of the Brilliant Star of Zanzibar, which Orders have been conferred by the King of Egypt and the Sultan of Zanzibar respectively in recognition of valuable services rendered by them.

ADDRESSES AND ORIGINAL ARTICLES

THE MECHANISM OF INFLATION OF THE LUNGS

AND THE INFLUENCE OF DEFLATION ON POST-OPERATION COMPLICATIONS.

BY SIR CHARLTON BRISCOE, BT., M.D., F.R.C.P. LOND.,
PHYSICIAN TO KING'S COLLEGE HOSPITAL.

IN the past three years a number of papers have appeared dealing with post-operative collapse of the lung, but the reader will find no agreed opinion about the production of this condition or the manner in which it should be treated. Nor does it appear to me that there is any clear distinction of the various conditions which are found and which have been called collapse. At least four have been included under this term, namely :—

(1) A condition in which the lower part of the lung is more or less airless, but in which there may be no symptoms. This may be called *simple deflation.*

(2) Simple deflation in which there is clearly a bronchial irritation varying in degree, with consequent mucous or muco-purulent secretion : *simple deflation with secretion.*

(3) The condition which originally attracted Pasteur's[1] attention, in which, sometimes without but generally with a very acute onset, one or both lower lobes of the lungs are found to be airless, the heart being displaced to the affected side. Purulent secretion may or may not develop : *massive collapse attack.*

(4) A condition of deflation of the whole of one lung, most commonly found in injuries (often trivial) of the chest, and not necessarily or usually as a post-operative complication. This has been fully described by Rose Bradford[2] from his experience in France during the war, and may be termed *massive deflation of one lung.*

The types of simple deflation are very common, but they have been neglected, attention having centred on the two rare conditions and their possible explanation. I hope to show that simple deflation is not merely very frequent but that it is essential that it should be studied and understood before speculation is indulged in concerning the nature of the more rare massive collapse attacks or deflation conditions.

BASIC ANATOMICAL AND PHYSIOLOGICAL FACTS.

There are two normal anatomical and physiological facts which must be kept persistently in mind, since they are constant influences in the production of deflation.

(1) *Elasticity of lung.*—Throughout the whole of life, after the first few breaths, the lungs never cease to try to contract down to an airless condition. They are prevented from doing so by the facts that they are enclosed in the thoracic cage, and that nature abhors a vacuum. The cage, however, nowhere quite rigid, shows different degrees of mobility in different parts, and such mobility is affected in various ways by different conditions. To put it another way: the lungs always deflate as much as they are allowed to, but this allowance is subject to very wide variations.

(2) *Minimal use at rest.*—Man is endowed with much more respiratory air space than he requires when at rest. This well-known and obvious fact, akin to the reserve power of the heart, has not been sufficiently stressed ; to all intents and purposes it has been ignored. This is accounted for by the fact that deflation has only been discovered when some pathological condition has necessitated examination, and hence a pathological condition has promptly been invoked as the cause of the deflation. The true sequence in these cases is that deflation ensues as a simple consequence of rest in bed.

As illustrating this point, the following three papers are of importance. My colleague, Dr. J. L. Livingstone,[3] has shown that, when changing from upright to supine, the volume of the chest, as measured by the excess of air exhaled, is reduced by about 500 to 1000 c.cm.—10 per cent. to 20 per cent. of the total volume of the lungs—and that in the intermediate position of reclining at an angle of 45° the diminution is proportional—i.e., about one-half. This reduction occurs within ten breaths. W. H. Wilson[4] has shown in a similar manner that the reserve air is reduced under similar circumstances by about 1200 c.cm. His observations were made two minutes after the change from the erect to the supine. These two observations were made on normal individuals.

J. R. Head[5] has shown that the vital capacity of the thorax is markedly diminished—from 8 per cent. to 80 per cent.—when tested during a period of from 2 to 18 days after operations, such as those on the abdomen, for removal of the breast, and for the treatment of hæmorrhoids. The value of this paper would be enhanced if the author could have recorded the diminution in the vital capacity of individuals who were rested in bed without operation—i.e., if he could have tested what occurs in the normal.

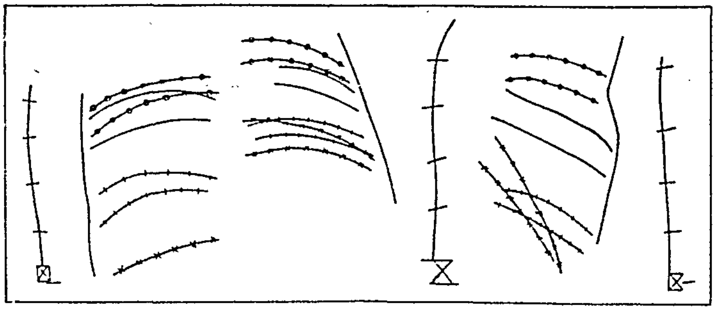
These three investigations show beyond doubt that under the circumstances in which the observations were made a considerable reduction in the volume of the thorax takes place. Livingstone's observations were made, so far as possible, with involuntary or unconscious—as opposed to forced—respiration ; the other two observations were made with forced, and therefore conscious, expiration ; they are of less value when applied to the usual and unconscious respiration, but are confirmatory of that change which Livingstone records in the normal individual. From these three papers, however, a logical deduction can be made : that on assuming the supine posture a diminution in the intrathoracic volume takes place immediately, and that such diminution is not limited to the first ten breaths but is continued for some time. In these circumstances the volume of the lung is decreased. Such a diminution might occur equally in both upper and lower lobes, or by a diminution in either one or the other. Further, such a marked diminution in the size of one lobe, either the upper or the lower, might occur as would necessitate an over-inflation of the alternate lobe.

The thoracic cage is a complicated structure of bone and muscle. In the past an attempt was made experimentally to gain an insight into its movements by reproducing the effect of maximal contractions of the muscles. In life, however—except perhaps in yawning, sighing, and asphyxia—such maximal contractions are not evoked ; the usual nerve impulses are not strong enough to produce them. At rest the weaker stimuli conditioned by diminished respiratory requirements evoke a smaller thoracic expansion. This diminished expansion is not the result of a general decrease of contraction of each muscle concerned. A process of selection occurs to determine which muscle or part of muscle shall respond to the weaker nerve impulse. In this selection or grading the condition of stretch of the muscle plays an important rôle. Hence the expansion of parts of the thoracic cage is unequal, and the diminution of lung volume and deflation which occurs at rest is by no means equal in all directions, but occurs in special parts in a special manner which I shall explain. Accordingly, an inquiry into the mode of respiration in circumstances where deflation is found will throw light on the mechanism of expansion of the different parts of the lung.

Although it is always desirable that pathological findings should not be taken into consideration before establishing a normal, yet this is almost impossible in the present investigation. I have, however, tried to base the conclusions upon those conditions which most nearly represent experimental findings.

Following the line of investigation in the normal individual assuming the supine posture with quiet breathing, two important points emerge—viz., an immediate change occurs in both diaphragm and thorax.

(1) The diaphragm is elevated.[6] The usual X ray inspection (tube behind and screen in front) demonstrates this point. Especially is this seen in the mid-axillary region, but mesially to the nipple lines the elevation is less marked. This view does not give a complete picture of what happens. By the employment of tangential views occurrences immediately below the surface of the ribs at any given points can be investigated, and the height (of the point) at which the diaphragm leaves the chest wall above the costal margin—the upper level of the costophrenic sinus—can be measured. By this means it is seen that an immediate rise occurs in the level of the costal diaphragm, particularly at its posterior part, in the scapular line, averaging 4 cm. on the right and 4·5 cm. on the left. The rise is much less—2 cm.—in the nipple line. There is, therefore, when assuming the supine posture, a general rise in the level of the costal diaphragm, and this is more marked in the postero-lateral than in the anterior regions. This elevation is least marked in the antero-posterior mesial area, the plane of the crus. At the same time the natural inspiratory descent continues, although it may be diminished. Pasteur [1] has shown that this diminution of the diaphragm movement persists some days after operation.



X ray examination (tangential), showing the points at which the diaphragm leaves the chest wall in different postures. The left figure records that point in the post-scapular line on the right side. The figure to the right illustrates the same in the left post-scapular line. The central figure illustrates the points in the right nipple line. In each instance: (1) The line with circle equals supine. (2) The straight line equals reclining at an angle of 45°. (3) The line with single dash equals standing. (4) The line with stars equals knee-elbow position. Where the lines are in pairs the top one is expiration, the lower one inspiration. Where it is single the position in both phases is constant.

The cross is placed on the lowest rib in the line under investigation. Vertical cross bars placed at inch intervals lie on outer surface of chest wall. Other vertical line represents pleural surface of chest wall. Subject, a healthy medical student, aged 23. Quiet involuntary respiration throughout.

(2) In the thorax the transverse diameters (at the three levels of the manubrium, gladiolus, and lower costal margin) and the antero-posterior diameter (at the first two levels) show increases.[6] The changes in the diameters of the upper part of the thorax attain their maximum in a few hours, but the transverse diameter at the level of the lowest rib continues to increase during several days (in post-operative cases), and probably the diaphragm continues to rise progressively with this change.

When assuming the supine posture, therefore, the transverse and antero-posterior dimensions of the upper part of the thoracic cavity are increased, while the vertical measurement is diminished. The net result of this change of posture—a diminution of capacity—occurs at the expense of the lower part of the thoracic cavity, and more at the back than anteriorly.

We should anticipate that the lower lobe would become de-aerated, "deflated," and the upper lobe would remain aerated or even hyperinflated *as long as the conditions of quiescence and recumbent posture persist.* Under such circumstances we do, in fact, find deflation of the lower lobes.

Deflation cannot be detected in the course of a few seconds—i.e., not as quickly as the changes in the diameters of the chest wall or the elevation of the diaphragm. It is marked in 36 hours.

Physical Signs.

Deflation of the lower lobe in varying degree is very common. It is not detected because, in the routine examination, the first few voluntary breaths taken by the patient obliterate the signs, and the front of the chest is examined fully before that of the back is commenced. It is when the patient does not, or cannot, take the deep breaths that the signs are detected. If, however, a rule is made to percuss and auscultate the back before asking for a deep breath, signs are readily detected. The signs will be found fully developed at the end of 36 hours, or less, in any adult patient who lies quiescent, and, therefore, regularly and typically for the first few days after operation.

As the lower lobe deflates, the anterior and inferior margins retreat, the base rising, and when deflation is complete the lobe occupies an area beneath triangular space delineated by: (*a*) the middle-lin spines of the vertebræ, (*b*) a *horizontal* line throug the eighth rib in the scapular line, and (*c*) an obliqu upper margin from the fifth dorsal vertebra to th horizontal line (*b*) as this cuts the posterior axillar line. This is the area where the signs are detecte Over a lobe partially deflated there are to be ma out:—

(1) Diminished resonance to percussion.

(2) Diminished air entry on inspiration, tub breathing, and sometimes crepitations.

(3) Increased voice sounds, and increased ta vocal fremitus.

These are the signs of a lung of which the de is increased, in this case by deflation. Where deflation is early the signs are less marked and crepitations occur with inspiration. As the lower lobe deflates more completely and shrinks towards the root of the lung and away from the chest wall, the air entry is less audible and voice sounds remain increased and bronchophonic. The triangular area contracts as the upper lobe becomes over-expanded and encroaches on it.

The diaphragm being elevated as a whole (back, front, and sides, the mesial portion least), the organs in relation to it are elevated with it. The absolute dulness below the eighth rib posteriorly is due to the elevation of the diaphragm and underlying organs. The liver dulness on the right side anteriorly is also elevated as high as the fifth rib or fourth space, and resonance from the abdominal organs may replace the lower area of normal liver dulness. On the left side the apex beat is elevated and rotated outwards so as to be behind the fifth rib or in the fourth space. The stomach resonance is high in the axilla.

When a deep diaphragmatic breath is taken, protruding the abdomen, these signs become less marked and, with repetition, disappear with a shower of crepitations, only to return with renewed quiescence. Those normal individuals with (*a*) big respiratory capacity, (*b*) a natural tendency to thoracic breathing, (*c*) signs of emotional distress, (*d*) loss of muscular control of the lower thoracic margin, (*e*) evidence of general debility, and (*f*) those who remain in such a posture that the spine is extended, tend to breathe with the upper thorax at the expense of the diaphragm and so to develop deflation of lower lobes the more readily.

The two first conditions are relatively commoner in the young, and in them deflation occurs the more readily. Collapse attacks of extreme severity are many times more frequent in the young than the old.

Pathological Evidence.

(1) *Simple picture.*—This appearance of simple deflation of the lungs has escaped attention, largely owing to the fact that in a routine post mortem we do not obstruct the trachea before opening the thoracic cavity. In consequence air escapes from the lungs and ante-mortem deflation is less noticeable. When the trachea is properly blocked—as by ligature over a cork inserted through a tracheotomy incision—the relative size of the lobes is readily noticed.

The simple picture is as follows: the deflated area is smaller than normal, darker in colour, and more solid to the touch, and the capsule is wrinkled. It contains little air, and therefore tends to sink in water. Microscopically, the walls of the air vesicles are approximated, blood-vessels are dilated, and fibrous tissue is distended and more obvious than usual. The fibrous tissue has to stretch to follow the shrinkage due to deflation. The walls of smaller bronchioles are sometimes as much approximated as those of the still finer portions of the lungs. The larger bronchial tubes are patent, and may or may not contain some mucus and cells. In a simple case there is no evidence of pleurisy or of inflammatory action in the lung or of desquamation of bronchial mucous membrane. The condition may be found affecting parts of the lower lobes in different areas and degrees; it is not of necessity limited to the lower lobe. The posterior part of the upper lobe may be deflated. All stages of incomplete deflation may naturally be found, and differences in the march or mode of the deflation of the two lungs are detectable.

This is the condition which is obviously present during life in many of our "bed patients" in greater or lesser degree. Ante-mortem œdema obliterates the evidence and, naturally, apart from œdema, the whole picture is frequently modified by the existence of injury or disease. A careful study of selected instances will help to illustrate. Such instances arise when death has occurred suddenly and without struggle, or when terminal œdema has not occurred in those who have lain quiescent prior to death.

The simplest condition may be best seen under the following circumstances, many examples of which have been observed and studied:—

(*a*) *Coma cases,* in those who have been unconscious and have lain still for hours or days prior to death as in cases of cerebral tumour. During life recumbency has been absolute, and there has been no forced breathing. In these there has been no impediment to the diaphragm or to the chest wall. There has been increased respiratory movement of the upper chest, and diminished abdominal protrusion. The movement of the epigastrium may even be reversed—inspiratory recession. By X ray the diaphragm is seen to be high and to descend in inspiration. The lower lobes are found post mortem in the condition described above. There is no obstruction to the bronchial tree.

(*b*) *Operation cases.*—During the first few days after operation, especially if there has been an incision through the abdominal wall, the patient is exhausted and movement painful. The epigastrium is found to protrude to some extent in inspiration, showing clearly that the diaphragm is not paralysed. The upper thorax is hyperactive in inspiration. The diaphragm is high, but inspiratory descent, though present, is diminished. When cases of this nature die suddenly and unexpectedly within the first few days after operation, as from pulmonary embolus, there will be found marked deflation of the lower lobes, with hyperinflation of the upper lobes. There is no obstruction to the bronchi.

(*c*) *Spinal cord lesions.*—In conditions of spinal cord obstruction in the upper dorsal or lower cervical region the patient is most comfortable when propped up, for gravity helps to counteract the notable elevation of the thorax by the scalene in inspiration and thus assists expiration. The intercostal and abdominal muscles are paralysed. The diaphragm can be seen by X ray to be at a remarkably high level and moving with inspiratory and expiratory excursion. (By volitional effort it can be temporarily depressed to a greater degree than is otherwise seen.) The lower lobes are more completely deflated than in any other condition. Sometimes the deflation extends to the back part of the upper lobes. The upper lobes are markedly over-distended. In cases of some weeks' or months' standing the bronchi contain a little material which, on investigation, is found to consist of cells from which the nuclei have mainly disappeared, and a small amount of mucus. There is *no obstruction* to the bronchi. The physical signs of deflation of the lower lobes are readily detected in such cases.

(*d*) *Unilateral phrenic paralysis.*[7]—In conditions in which one phrenic nerve is blocked by pressure, as from glands in the neck, thus throwing out of *action* half the diaphragm, the movement of the chest wall is not impeded, but may be increased. The unaffected portion of diaphragm contracts normally; the paralysed half is somewhat elevated and has a paradoxical action. The lungs show (*a*) a considerable degree of deflation of the lower lobe on the affected side, (*b*) a fully inflated lower lobe on the sound side, (*c*) a considerable degree of deflation of the upper lobes, more on the affected than on the unaffected side. There is no obstruction to the bronchi of either the lower or the upper lobes.

The above four instances, being concerned with normal lung, are examples almost experimentally ideal. They show that under conditions of respiratory activity reduced to the minimum by posture or weakness, a defect of expansion of the lower lobe occurs. When correlated one constant factor emerges: the lateral part of the diaphragm beneath the deflated lower lobe or lobes is elevated. The condition of the chest wall varies, as does the inspiratory descent of the diaphragm. We are led to the conclusion that expansion of the lower lobe requires a combination of two factors: (1) a low, and (2) a contracting diaphragm. Applying the same interpretations, the degree of inflation of the upper lobe is dependent (1) upon the maintenance of a condition of postural tonus in the whole diaphragm (as opposed to paralytic tonelessness in part); and (2) upon activity of the upper chest. This latter deduction is in accord with the findings in the oft-quoted case of Pearson Irvine.[8]

So far we have considered conditions marked, as far as the lung is concerned, by nothing but simple lack of muscle movement. Further confirmation is provided by examples of pathological conditions, for instance:—

(e) *Cardiac dilatation*, when associated with pericarditis, is recognised as a condition in which deflation of one or both lower lobes occurs. The so-called rheumatic lung [9] is an example of deflation with an avirulent infection. I have no X ray evidence to show that the diaphragm is elevated. The physical signs—raised apex beat and liver dulness, with diminished epigastric protrusion and excessive thoracic breathing—indicate elevation. But further, in cases of cardiac dilatation due to valvular lesions, with crepitations (so-called œdema) of the bases, when sudden death occurs—as by rupture of an aneurysm into the pericardium—the lower lobes show the typical appearance of deflation and no œdema is present. There is no obstruction to bronchi. Respiration is preponderatingly thoracic. Livingstone and I have shown experimentally in rabbits that certain interferences with the heart through the open pericardial sac causes an elevation of the diaphragm. So-called "back-pressure lungs" are, in my opinion, merely deflated, and œdema, as in other conditions, is only a terminal event.

(f) *In acute pleurisy*, affecting one lower lobe, the homolateral costal diaphragm is raised and movement is diminished. In the early days the upper chest is held elevated, and the lower chest is fixed by intercostal and abdominal muscles. In cases of pleuropneumonia in which death occurs during the stage of red hepatisation, as the result of the pleurisy the lower lobe on the affected side is found actually to be smaller than its fellow—i.e., in the early days it is partially deflated. The main bronchi are not obstructed.

(g) *In localised peritonitis*—as, for example, that affecting the peritoneum in the region of the right lobe of the liver—an elevation of that half of the diaphragm, with diminished movement, is found by X ray. The restricted respiration is carried out by elevation of the chest—scalene action—and upper thorax expansion, deflation of the corresponding lower lobe being marked.

(h) *In cases of diphtheria* with paralysis of the diaphragm the condition of the lungs described by Pasteur [10] is one of deflation on which œdema is frequently superadded. In these patients the supine posture is adopted.

SUMMARY.

The foregoing observations show that whenever the respiratory effort is at a minimum, and the individual in a reclining or supine posture, the capacity of the chest diminishes. As soon as these conditions arise, the lung commences to deflate, this deflation being mainly seen in the lower lobes and being independent of bronchial obstruction. Toxæmia—or other conditions producing lowered vitality—exerts an effect through muscular weakness and greater passiveness of the subject, while local conditions influencing the height of the diaphragm further accentuate the deflation.

In adults, deflation is marked in the course of 36 hours; in children it is detectable within half an hour. The signs can disappear readily if the patient be induced to take deep diaphragmatic inspirations. When quiescence is resumed, deflation promptly recurs. It is more accentuated when the costal margin is unstable as the result of lack of action of the abdominal muscles. This defect is especially marked when the muscle has been injured, as during operation. The condition is typically found in people who remain in one posture because they are very ill or physically weak, or because pain prevents movement. The fundamental cause is the reduction of the necessity for a large air entry, and it is not necessary to postulate any other causal factor. The point to be accentuated is that deflation of the lower lobe occurs in all individuals who recline in one position without exerting themselves. If the lung is temporarily expanded or inflated deflation recurs at once on resuming quiescence.

The Influence of Deflation on Post-operative Conditions.

When pulmonary complications follow operation, deflation must be regarded as the primary condition on which further changes which occur in the lower lobes are implanted, and no explanation of pathological changes can be complete or accurate which does not take this deflation into account.

SIMPLE DEFLATION.

A lung deflated as described possesses a circulation, and the activity dependent thereon continues—e.g., in the nutrition of the lung in the function of reproduction of the cells lining the alveoli and of the bronchi, in the function of the mucous glands in producing mucus in varying quantity, and in the general response to infection. With little irritation this will produce no clinical manifestation, so we find:—

(1) *Simple deflation.*—In most instances this is not detected. No symptoms occur to attract attention. It merges into:—

(2) *Simple deflation with secretion:* (a) *Non-pathogenic.*—Sometimes a loose, shallow, unproductive and frequent cough occurs, suggesting a liquid mucus which is not brought up to the mouth. It resembles the typical cough in the case of an empyema. Frequently in uncomplicated cases of deflation, as after operation, the mucus is expectorated at the end of three to seven days. It may be grey in colour, or green or dull red, not giving a test for blood. Besides mucus and shadow alveolar and bronchial cells, a number of bacteria are present which, in the absence of polymorphonuclear leucocytes and pyrexia, are clearly acting not pathogenically but as parasites or saprophytes, and they explain the colour of the mucus. In some cases there is a tendency to the secretion of an excess of mucus. The secretion may vary in consistence from that of a bronchorrhœa

to that almost resembling fibrinous bronchitis, but such extremes are rare.

(b) *Pathogenic.*—If the bacteria act pathogenically the secretion becomes purulent, and pyrexia and signs of bronchitis with distress on coughing result. Inhalation of infected material into the deflated lung consequent on deeper respiratory movements gives rise to various conditions of bronchitis, bronchiolitis, broncho-pneumonia or pleurisy. In such instances pleurisy is not very acute. The bronchus may be infected before, during, or after the operation. These two types are readily understood.

THE MASSIVE PULMONARY COLLAPSE ATTACK.

This type was originally described by Pasteur.[1] Usually, though not invariably, the onset is very acute, with pain, orthopnœa, cyanosis, and general distress. These symptoms, however, pass off in 48 hours. On the affected side the lower lobe of the lung is found to be airless. Although the upper lobe is over-expanded the air entry is poor. The heart is displaced toward the affected side, which, on measurement, is found to be diminished. On the unaffected side the lung is over-distended and the air-entry is good. If both sides are affected, the heart is mesial. Purulent secretion may or may not develop. The genesis of this condition is obscure, and three main theories have been put forward to explain it, none of which take cognisance of the condition of deflation which exists in the early days after operation, and therefore prior to the attack.

1. The first theory is the original theory of Pasteur,[1] which ascribed the condition to sudden paralysis, which might be reflex in origin, of some of the respiratory muscles. He clearly likened the condition of these to the paralysis of other muscles which is found in diphtheria, and ascribed the various changes directly to a sudden lack of distending power.

2. The second theory is that the condition is the direct result of obstruction to the bronchi. This obstruction may be due to mucus or to spasm or paralysis of the bronchial muscles. The theory is based upon the well-known experiments of Lichtheim[11] and the results of observations on foreign substance in the bronchial tubes. In most cases the holders of this theory—Elliott and Dingley,[12] Boland and Sheret,[13] Santé and Morrison[14]—would not admit the rôle of respiratory muscular defect; while others (Lee,[15] and Jackson and Lee[16]) would allow that embarrassed respiration may play a part. Woodburn Morrison[17] is driven to invoke the necessity of vagal or sympathetic action.

3. The third theory suggests pulmonary emboli as a causative factor (Cutler and Hunt[18]), such emboli being held to be not only of venous origin, but travelling also through the lymphatics. By both paths the origin of the emboli is placed in the neighbourhood of the wound, and in many cases sepsis is admitted as a contributory factor.

Each of these theories evades recognition of the physiological condition of the lungs found in the resting patient in the early days after operation, but tacitly assumes that the lungs are in the naturally expanded condition found in ordinary life, and accordingly seeks to explain the sudden change from such a state into that found in the massive collapse attack. This false premise renders criticism of these theories almost unnecessary and certainly difficult. The points requiring explanation are the suddenness of the attack, its duration, the pain and pyrexia, as well as the relationship of the physical condition of the lungs and heart found at the moment to the condition of deflation of the lower lobes present before the attack.

Theory 1.—In his post-diphtheritic cases Pasteur[10] used the term paralysis to indicate a condition of the diaphragm similar to the paralysis of the eye or pharyngeal muscles. Basing the condition of the post-operative massive collapse attack on the foundation of paralysis of muscles in diphtheria, he considered that the condition of the lung was a similar development to that found in diphtheria, but that, instead of occurring gradually, the onset came with cataclysmic suddenness. When limited to one lobe this was due to paralysis of one phrenic nerve and of half of the diaphragm.

Except in cases of direct pressure on or injury to the nerve, I have never seen true phrenic paralysis. Unilateral phrenic paralysis, when uncomplicated, gives rise to different signs.[7] Further and more important, as underlying the pathology of the collapse attack, in these cases of post-diphtheritic paralysis so-called), the diaphragm can be induced to contract. Physical signs show that it is elevated, but when the lower thoracic expansion is controlled—depressing the lower ribs by axillary pressure and bringing them towards the middle line—the diaphragm contracts, the epigastrium is protruded, and the signs of collapsed lung disappear. In ten cases of this condition I have never failed to demonstrate this point, a fact which shows that in these post-diphtheritic cases the condition is really one of marked postural deflation. I agree that a physiological lack of distending muscular power is the basis of deflation, but I do not agree on the mechanism by which it is suggested that the acute collapse attack is produced. Further, pain and pyrexia are not explained.

Theory 2.—Deflation certainly occurs without endobronchial contents. This fact is against the theory which explains the condition as analogous to that of a foreign body in a large bronchus. It is difficult to see how a large bronchus can be occluded by muscle spasm. Occlusion could occur in a small bronchus, and such action might be regarded as a protective mechanism for the part of the lung rendered airless. The theory does not explain (1) the constancy of the deflation in the lower lobe, (2) the irregularity of its distribution in the lower lobe, (3) its extension in the upper lobe on rare occasions, in each instance without symptoms or bronchial obstruction, or (4) the fact that what I have termed deflation with secretion occurs, and without these acute symptoms. It is possible that a spasm of a bronchiole muscle can withstand the depressive power of an active diaphragm; if the spasm could do so it is difficult to conceive that with a contracting diaphragm the imprisoned air could be absorbed. Nor does it explain the rapid expansion of the lower lobes which occurs when diaphragmatic movements are induced. Still less does it explain the suddenness of the onset of massive collapse or the pyrexia or pain.

Theory 3.—Deflation occurs without evidence of emboli. Such limitation of distribution does not occur in other conditions in which emboli invade the lung.

None of these three theories takes cognizance of the fact that the massive collapse attack comes on as a rule a day or so after the operation, and is therefore implanted on the condition of the lung existing at the moment. This I have shown to be one of deflation affecting both lower lobes, and without temperature or pain. The attack is associated with pyrexia, indicating infection, and acute pain. As a rule the onset is sudden and unexpected. Occasionally a sensation of something impending is present. The affected side is small below, expanded above and motionless, and air entry is deficient.

In my opinion these massive pulmonary collapse attacks are really instances of acute pleurisy occurring when the lower lobes of the lungs are already in a condition of simple deflation, and my reasons for this opinion are as follows:—

(1) In many of the instances described the presence of pleurisy has been admitted, either in the account of cases which have recovered, or in that of the post mortem. (Though admitted to be present, it has been excluded as the cause of the attack.)

(2) Muscles acting on the affected side of the chest behave in the same manner as they do in cases of pleurisy—i.e., (*a*) the lower intercostals are firmly contracted, (*b*) the scalenes and upper intercostals are contracted also, but to a lesser degree, in the early stages, (*c*) the abdominal muscles acting on the lower thoracic margin are similarly involved.

(3) These lower intercostal muscles are intensely sensitive to pressure, which increases the pain exactly as in pleurisy from other conditions—e.g., pneumonia. The abdominal muscle, which has been incised at operation, when forced into a protective contraction is intensely painful. (Generally in pleurisy the abdominal muscles are not sensitive to pressure.)

(4) The sudden onset of pain corresponds to the similar onset in many cases of pleurisy, and in both conditions may be first noticed following a movement.

(5) The duration of the acute pain is about 36–48 hours, which is also a common time for the duration of pain of acute pleurisy.

(6) Relief in both pleurisy and the collapse attack is immediate when suitable restriction, as by a tape and spring, is applied. Mechanical restriction of chest movement, by performing the work of the intercostal and abdominal muscles, allows these to relax, hence the relief of pain.

(7) Pleurisy explains the temperature as well as the physical signs—i.e., (*a*) tonic contraction of intercostals causing a diminution in the size of the lower chest; (*b*) tonic contraction of the elevated costal diaphragm on the affected side; (*c*) persistence of a state of deflation already present before the attack; (*d*) deficient air entry resulting from imperfect expansion of the over-distended upper lobe (it remains over-inflated, though silent, when the scalene and upper intercostals are tonic, but deflates in those cases in which, a day or so later, the upper intercostals go out of action); (*e*) compensatory over-expansion of the other lung. (*b*) and (*c*) explain the shift of the mediastinum to the affected side.

The essential difference between a massive collapse attack caused by pleurisy and an ordinary pleuritic attack lies in the facts that in the former the lower lobe is already deflated, and in many cases a muscle in which tonic contraction occurs has been incised, and contraction is painful. The uncertain point here is the assumption of a tonic or spastic condition of the costal diaphragm, as a result of pleurisy. I think it justified because I find the same changes (elevation and lack of motion) in the diaphragm in these cases of collapse as are found in acknowledged cases of pleurisy. The infection has in most cases come through the diaphragm from below, and I am ascribing to the diaphragm a reaction which certainly occurs in other muscles under like circumstances.

Hence I consider that these cases described by Pasteur as massive collapse attack of the lungs are instances of well-marked simple deflation in which the condition on one or both sides is suddenly modified by the onset of an acute pleurisy. I do not believe that bronchial obstruction or embolism have anything to do with them.

DEFLATION OF A WHOLE LUNG.

The explanation of deflation of a whole lung is more difficult because the condition is seldom seen in civil practice, and is not essentially a post-operative condition. Under war conditions slight or severe injuries to the chest were exciting causes, producing deflation of the whole lung on the same side as the trauma, or on the opposite side. This injury might be to the upper or lower part of the chest wall. It raises questions of a reflex inhibition of expansion and of injury by contra-coup. (In many experiments to elicit a reflex inhibition of one-half of the diaphragm only very occasionally was evidence obtained at all, and then only by a reflex arising from the chest wall on the application of heat or cold. The effect was slight and incommensurate with the stimulus.) In two cases of chest injury seen recently, the one severe and the other slight, both in children, the whole of the left lung was out of action—deflated. The diaphragm was high and the outline not clear, so that immobility was not definite. The scalenes and upper intercostals on the left were toneless, giving rise to a flattened and motionless upper chest, while the lower intercostals were tonic. Both the upper and lower areas of the chest were thus diminished. In these two cases the mechanism of production clearly was defective muscular action.

This brings all four types of deflation into one category—deficiency of muscular action in expanding the lungs. At present we must consider the fourth condition as differing from the first three, inasmuch as the upper part of the thorax is out of action, the whole lung being affected.

Therapeutic Indications.

The conclusion to which we have been led is that, whenever an individual remains at rest in one posture with respiratory exchange at a minimum, deflation is bound to occur. Youth, early adult life, certain types of breathing and conditions of disease producing marked weakness or unconsciousness, naturally increase the tendency to this condition. If the individual is disturbed, the expansion of the lung may be partially or fully restored for the time being, only to deflate when the disturbance is discontinued. Local lesions, injury or disease may modify the distribution or extent of the deflation, and the clinical picture may be altered by complications occurring when the deflation already exists, but these are addenda and should not be allowed to disturb our conception of the basal physiology of the condition —a deflation of the lung resulting from diminished muscle action. The more severe the operation, especially in the upper region of the abdomen, the more marked will be the deflation.

The occurrence of massive collapse attacks has suggested that therapeutic measures should be applied to every abdominal operation case, in order to obviate post-operative pulmonary conditions. Among such routine measures are the administration of carbon dioxide to produce deep inspirations, and turning the patient on his side, with or without smacking. Any routine treatment is a mistake, because so many escape any symptom at all, and to put patients to pain and distress within a few days of the operation is certainly unnecessary and inexpedient. It is not advisable to promote deep breathing if there is a likelihood of carrying infection to the deeper part of the lung.

Simple deflation.—So long as the individual is quiescent, only requiring the employment of a small portion of his respiratory area, there is no need for the lung to be fully expanded, or for muscular action causing pain to be encouraged. More lung will become inflated as more respiratory changes are necessitated. The majority of subjects of operation pass through these stages without symptoms which attract attention. It is therefore unnecessary, to say the least, to adopt any routine measures which aim at promoting once or twice a day expansion of the lung accompanied by fatigue and distress.

Simple deflation with secretion.—During the course of the administration of a general anæsthetic, respiratory movements of the greatest intensity are induced, and all parts of the lung must be over-distended. At this time there is every opportunity for infective material to be aspirated. After the operation the breathing becomes as shallow as possible. As a result, an excess of mucus may be secreted in the large bronchi. In many cases this is not pathogenic. There can be no object in causing it to be inhaled into smaller tubes. If the respiratory tract has become infected, either in the main bronchial tubes or below the level of the cough reflex, no method of fully expanding the lung is going to improve matters. Sputum is viscid, coughing painful, and every effort exhausting. The lung requires time to develop resistances, general and local: serum, leucocytes, alveolar cells, and mucus. The condition may be made worse if the infection is aspirated to the very surface of the lung, and pleurisy results. Further, when therapy to expand the lung has been employed, directly it is discontinued the lung proceeds to deflate, progress only broken by the cough and the next therapeutic application.

The massive collapse attack, in my opinion, is the result of pleurisy, which may arise by a spread to the surface from the deeper parts of the lung through the visceral pleura, but which more usually (where no pulmonary symptoms have preceded) originates from sepsis arising from the seat of operation through the parietal pleura. Forced expansion will not improve this. It is important to see that full respiratory activity has been reacquired by the subject after operation, especially if the lungs have been involved, but this should not be investigated until 14 days or so after operation, or when the patient is getting up.

I therefore strongly deprecate methods which aim at expanding the deflated lung in the early stages after operation. In the great majority of cases no effect of the deflation is perceptible, and the means suggested are unpleasant; where symptoms arise the procedure on theoretical grounds is inexpedient, and a paper by Dr. Fuller[19] confirms that practically it is detrimental.

Points to be recommended are:—

(1) After operation the sitting-up posture assists respiration because gravity helps expiration by allowing the thorax to descend, counteracting the inspiratory elevation of the scalenes and intercostals and obviating the necessity for abdominal muscle action for this purpose. This is especially true of the type with thoracic breathing. The individual should be allowed to choose the position which is comfortable, and be encouraged to change frequently.

(2) Bandages should *not* be too tight above the level of the umbilicus. It is here that abdominal protrusion in diaphragmatic inspiration is greatest in degree. On the other hand, a tight bandage supports the incised muscle. It is largely a question for the individual patient and the type of breathing he has developed.

(3) Movements of head and arm and of all sorts, as soon as these no longer cause pain, should be encouraged as inducing contraction in abdominal muscles and so relieving muscle monotony. The contraction of the diaphragm is increased, its level is lowered, and a step is taken towards expansion of the lower lobes.

(4) When non-viscid sputum is present: (*a*) the mildest symptom is half-hearted cough 18 hours or more after operation, sometimes as much as every half-minute, with no expectoration. Eventually some mucus is expectorated, usually after four or five days. This has accumulated in the "test-tube bronchi." There is not enough energy to get air behind it. As a rule, this requires no treatment. (*b*) If the condition is troublesome, the patient should be instructed to breathe in as slowly and deeply as possible and then to give a short, sharp expiration, which produces expectoration. During this effort he should support the lower thorax with a hand in either lower axilla, the nurse supporting the abdomen with her hand on the bandage over the area of incision. (*c*) After the third or fourth day, in addition, he may try gently turning into such a position that gravity helps the mucus to run out of the bronchus into the trachea, where it can be brought up. (*d*) If pyrexia is present and the sputum is purulent instead of mucoid, a Burney Yeo inhaler should be employed with the usual antiseptic inhaling fluid, the inhaler to be worn as continuously as possible. The success of this is dependent on the manner in which it is introduced, on the instruction that deep breathing is contra-indicated, and on seeing that the face is not burned by the creosote.

(5) Should the temperature rise after the lapse of 24–48 hours with respiratory distress, the sputum will at first be scanty and viscid, and the cough irritating and non-productive. Treatment should chiefly be directed to rendering sputum liquid and easily expectorated. Most important is the rapid administration of alkalis well diluted, every hour or two hours until the urine is alkaline, and of medicated vapour inhalants and such anodynes as are safe. In the common type of condition, beginning on the second or third day, the temperature will be down and expectoration easy, though the cough is still painful, on the fourth or fifth day.

(6) When more severe, the infection may be spread to deeper parts. The cough and associated deeper respirations expand the lung and fresh areas are infected. Hence arise bronchiolitis, broncho-pneumonia, pneumonia, and late patchy pleurisy, with the usual sequelæ. Treatment is such as is usually employed for these conditions. I have not met with cases of such severity as to require that the bronchial contents should be removed by mechanical means. The upper lobes alone are quite capable of coping with the respiratory requirements when at rest.

The distress of the collapse attack, as stated above, is readily relieved in a few minutes by controlling the movement of the side affected, as is the pain in pleurisy. A broad tape with a spring inserted is most efficient. The pain on coughing is not extinguished in either of these conditions, and for the same reason. A septic pleural effusion with its consequences may, of course, develop in pleurisy following operations, as in other forms of pleurisy, and requires similar treatment.

PROPHYLAXIS.

The troublesome time for the development of pulmonary infections is during the earlier days after operation. The longer the interval the greater the recovery from shock, asthenia, disinclination to move, and pain on so doing, and consequently from the deflation in the lung present in the earlier period.

The infection may have spread from a chronic condition in the patient's respiratory tract or mouth, when, generally, it does not lead to very severe results, the patient being no doubt to some degree protected. The greater the care taken to eradicate sepsis in these areas before operation the better. Probably the more severe cases arise from operation when the subject is starting a cold; I have seen many instances of this. The pulse chart shows an increase of rate within the 36 hours and the temperature chart a slight rise within the 24 hours preceding the operation, and the patient has admitted that he was not well but has thought the cause was fear. Except in cases of emergency, if there is a suggestion of acute respiratory indisposition, the operation should be postponed, though such a course is upsetting to all concerned. One of the worst cases of post-operative pulmonary infection I have seen arose after an operation on a quiescent appendix when the patient was developing a cold and had a temperature of 99·2° F. It is widely recognised that pulmonary complications in the majority of cases follow within 48 hours of the operation; 48 hours or less is a common incubation period in ordinary life for the development of catarrhal symptoms after exposure to infection. There is therefore every reason to surmise that signs and symptoms occurring 24–48 hours after the operation are attributable to infection about that time. Hence prophylaxis against infection at the operation is a most important point. In addition to the lowering of reflex activity by morphia, the drying-up of secretion by atropine, the suppression of the naso-pharyngeal filter by a mouth gag, and the excitation by the anæsthetic of very deep inspiratory efforts in a moist superheated atmosphere, there is considerable overcrowding in the immediate vicinity of the patient.

Of four patients operated upon in one afternoon, three developed acute respiratory complications and one died. A member of the operating team was developing an acute cold. Among the populace there seems to be an idea, half believed by the medical profession itself, that the infections of doctors and nurses differ from those of other people and are not communicable. Liability to infection from the surgical team, from ward nurses in attendance, and from visitors ought to be avoided. Face masks are insufficient protection in such conditions. Persons with acute infections should not be allowed near the patient during the early days after operation.

CONVALESCENCE.

It is just as important to see that full respiratory movements are restored after any abdominal operation as it is after pleuritic affections. There is the greater tendency for the individual who inclines to thoracic breathing to neglect fully to re-employ the diaphragm. As a rule, this defect rights itself as exertion increases; until it does so complaints indicative of dyspnœa, asthenia or lethargy, and of pain about the sternum, are apt to be made. When correct diaphragmatic breathing is restored by re-education, these symptoms disappear, and no patient should be discharged before it has been obtained. Failure to re-educate the diaphragm after prolonged rest is a common cause of the illness of the patient who has "never been well since the operation." In certain obstinate cases where puncture has to be made to restore activity, carbon dioxide inhalations might quite well be tried first. Such cases are very rare.

I have endeavoured to stress the importance of deflation as occurring after operations; its recognition is equally necessary in the consideration of many other pulmonary conditions. Though frequently preached, the significance of deflation has not yet been generally assimilated.

Conclusions.

(1) The total volume of the chest is diminished when the reclining or supine posture is assumed. (2) The capacity and expansion of the upper part of the chest are increased. (3) The capacity and expansion of the lower part are diminished. (4) Inflation of the upper lobe depends on expansion of the upper part of the thorax, combined with tone in the diaphragm. (5) Inflation of the lower lobe is dependent on a low level of the diaphragm, and probably on inspiratory descent of the costal portion. (6) Deflation occurs in all persons who are quiescent when reclining or supine, and therefore is present in most of our bed patients, particularly those subjected to operations. (7) In the great majority of cases no symptoms follow. (8) Infection, if present beforehand, may be spread. Frequently it is acquired at the time of the operation. (9) Therapeutic expansion of the lung in the early days after operation as a routine measure is not advisable; but (10) Before discharge, voluntary control over the diaphragm should be fully acquired.

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ALBUMINURIA COMPLICATING PREGNANCY.

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PART I.*—THE DANGERS.

So much has been heard lately of the mater risks that pregnancy, especially abnormal pregnan entails that it will not be out of place to consi the ultimate reason for taking these risks. The rea of course, is the child; and the greater the v placed upon the child, the greater will be maximum risk that is considered justifiable for th mother. In the particular instances that we are considering—i.e., pregnancies complicated by albuminuria—it will be an advantage to know exactl how often a fruitful result is attained. There can no justification, beyond the hope that it might h been different, in taking any avoidable maternal ri for the sake of an abortion, a macerated fœtus, or a infant which dies in early infancy from prematurity.

In cases of albuminuria the dangers to the fœtus are two: (1) the risk of abortion or death in utero as the result of the toxæmia; (2) the risk of death from prematurity in early infancy in cases where pregnancy has been terminated either accidentally or by intent, sometime before full term. In the inuria during pregnancy is running several risks, which may conveniently be summarised as follows:—

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* Part II., dealing with treatment, will appear next week.

1. *The danger of eclampsia.*—We have seen that, provided reasonable care and treatment are forthcoming, this is very small.

2. *The danger of developing patent chronic nephritis.*—With the standards of treatment that have in the past been considered adequate this danger is considerable—about 10 per cent.

3. *The danger of developing occult nephritis.*—With he standards of treatment that have in the past been considered adequate this danger is probably in the ion of 50 per cent.

4. *The danger of losing her fœtus by maceration in ro.*—When induction of premature labour is resorted or inductions that have in the past been deemed sonable, this danger is about 9 per cent.

—. *The danger of losing her infant in the neonatal iod from prematurity.*—When induction of premature labour is resorted to for inductions that have the past been deemed reasonable this danger is o per cent.

above estimates of the risk are true only for ly healthy patients. If there is any permanent damage before pregnancy the risk becomes all the greater, but even as it is set out above it is surely sufficient cause for us to look critically upon our accepted treatment of toxæmia of pregnancy, in the hope that we may find some places at least where improved methods may be instituted.

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THE ÆTIOLOGICAL IMPORTANCE OF THE ELEMENTARY BODIES IN VACCINIA AND FOWL-POX.

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THE purpose of this brief communication is to place on record some new observations which, so far as they go, support the claim that the Paschen and Borrel bodies met with in the lesions of vaccinia and fowl-pox represent the actual viruses of these respective diseases. During the past six years, while occupied with various studies on these viruses, I have given a good deal of attention to these minute bodies, which occur with absolute constancy in the lesions, and are readily detectable by appropriate staining methods. That in the early stages of the vaccinial lesion in the skin of the rabbit these bodies increase enormously in numbers and appear to be quite free, I have noted elsewhere. In the later or healing stages of the lesion the bodies congregate in the neighbourhood of the inflammatory cells of the exudate, and the impression obtained has been that the bodies are actually phagocyted, though, so far, phagocytosis has not been proved, owing to technical difficulties of demonstration, which, however, may yet be overcome. The behaviour of the bodies from their first appearance in the lesion, their increase in numbers as the lesion progressed, and their final aggregation among cells in the exudate suggested analogies at least with that of frankly bacterial invaders associated with skin phlegmons.

In fowl-pox the status of the Borrel bodies as possible agents of this disease has very materially advanced in the past three years, particularly since the experimental demonstration by Woodruff and Goodpasture (1929) that a single Bollinger inclusion body can infect. As fowl-pox virus is filtrable through the lower grade filters which retain bacteria, the infecting agent in the large Bollinger body *must* necessarily be something considerably smaller. Since then I have, like the American workers, been successful in demonstrating that the large Bollinger inclusion body which is so striking a feature of the fowl-pox lesion is really an aggregation of the minute Borrel bodies. Giemsa-stained preparations showing this relationship between the Bollinger and Borrel bodies were demonstrated at the International Congress of Botany in Cambridge in August, 1930, and at the Pathological Society of Great Britain and Ireland in January, 1931. To many minds this proved relationship between a minute body of dubious nature and a large structure like the Bollinger body, which has been known and variously interpreted for 60 years, would, of itself, supply cogent evidence for the view that the Borrel body represents the actual virus. I may add here that in potent bacteria-free filtrates, both of fowl-pox and of vaccinia virus, I have succeeded in demonstrating elementary bodies in stained deposits from filtrates spun at high speed. It was obvious, however, that other lines of inquiry which might yield crucial evidence in support of the ætiological relationship had to be explored. One line of inquiry was clearly serological, in view of the mass of evidence now available that extracts prepared from vaccinial and small-pox lesions fix complement, or are specifically precipitated, in the presence of anti-vaccinial sera. The work of Gordon (1925), Bedson and Bland (1929), Burgess, Craigie, and Tulloch (1929), and Craigie and Tulloch (1931) may be alluded to in this connexion.

The only evidence I can find bearing on the influence of specific immune serum on these elementary bodies is that recorded by Prof. Paschen, who found, and figured, in stained preparations of precipitates obtained by the interaction of "immune serum" and lymph from vaccinated children, agglutinated masses of elementary bodies.

During the past five years I have made repeated but, until recently, quite unsuccessful attempts to secure from vaccinial and fowl-pox lesions pure suspensions of elementary bodies that might be employed for serological test, and especially for agglutination. From the repeated failures it gradually became clear that certain requisites were essential for success. It was advantageous to employ material from early lesions (on skin of rabbit or comb of fowl) in which the elementary bodies were numerous and free. Such material was triturated thoroughly in a mortar with distilled water. The crude suspension was then shaken up in a flask with at least an equal volume of ether, and allowed to stand on the bench for at least 24 hours, being frequently shaken up during this period. The suspension was then centrifuged at high speed. The upper layer of ether and the large middle layer of light fatty matter which had risen to the surface were removed, leaving an underlying opalescent fluid, and occasionally a small deposit.

This underlying layer, together with the deposit, was again centrifuged at high speed for at least one hour (9000 revolutions per minute). The resulting deposit was collected after discarding the supernatant fluid. This small deposit, consisting of elementary bodies and some debris of cells, was then taken up and suspended in formolised saline (1 in 400). By further fractional centrifugalisation of this suspension and natural sedimentation, it was possible to eliminate practically all of the grosser debris, leaving only the elementary bodies. At all stages of the process the degree of refinement of the suspension was controlled by microscopical examination of appropriately stained samples.

Microscopical examination of the final suspensions in formolised saline by Giemsa (long method) or carbol fuchsin, preceded by Loeffler's flagella mordant, revealed a carpet of uniformly distributed elementary bodies.

AGGLUTINATION TESTS.

These suspensions have been tested with various sera but, so far, only on a small scale. The sera include normal fowl and rabbit sera, fowl sera, both from recovered fowl-pox and from hyper-immunised fowls, and antivaccinial sera, obtained by hyperimmunisation of rabbit and horse. The tests have been most conveniently made in hanging drops on coverslips in vaselinised chambers, which permit the microscopical examination of the progress of any reaction taking place between the two reagents. It has emerged that the elementary bodies of fowl-pox are not clumped by sera of young normal chicks in dilutions of 1 in 5, but are clumped by the sera of fowls at various periods after recovery from fowl-pox in dilutions ranging from 1 in 20 to 1 in 160. Sera of hyperimmunised fowls also clump the elementary bodies strongly in fairly high dilution. Similarly the elementary bodies of vaccinia (Paschen bodies) are clumped by hyperimmune sera in high dilution, but not by normal rabbit sera in dilution of 1 in 5. The agglutination experiments so far have been largely qualitative, with a view to establishing the fact that the elementary bodies are agglutinated in the presence of the corresponding antiviral serum. Quantitative titrations will be undertaken later, now that a satisfactory technique has been secured.

The clumping of the elementary bodies in the hanging drops can be readily followed, and the picture presented is in no way peculiar. The clumps have also been examined by various staining methods, which clearly reveal their composition.

SUMMARY AND CONCLUSIONS.

Homogeneous suspensions in formolised saline of the elementary bodies met with in vaccinia and fowl-pox (Paschen, 1906; Borrel, 1904) have been secured, which are free from other elements. The bodies in such suspensions are agglutinated by the sera of animals (fowls and rabbits) which have recovered from fowl-pox or vaccinia respectively or which have been hyperimmunised. So far as tests have revealed, they do not appear to be agglutinated, even in dilutions of 1 in 5, by normal sera. The agglutinated masses from hanging drop experiments have been appropriately stained, and shown to consist solely of these bodies.

The new data support the original claims of their discoverers, on grounds of association alone, that the elementary bodies represent the actual infecting agents. With recently reported improvements in methods for cultivating certain viruses in vitro it may be possible to determine whether growth of "virus" as determined by animal experiment is associated with corresponding growth of elementary bodies.

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INFANTILE HYPERTROPHIC PYLORIC STENOSIS.

SYMPTOMATOLOGY, TREATMENT, AND PROGNOSIS.

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ALTHOUGH infantile hypertrophic pyloric stenosis is observed relatively infrequently in a general hospital, it has seemed profitable to study a small series of patients with special reference to the after-history in relation to the treatment adopted. At the Middlesex Hospital, between the years 1919 and 1930, 18 children were treated for this malady. I have personally observed and followed up seven of these, and I have also analysed the remaining 11 cases and investigated their after-histories.

If the 18 cases are arranged chronologically it is found that the first five (1919–1924) were treated medically, while the remaining 13 were treated surgically by Rammstedt's operation. This illustrates the trend of opinion in this country. In Barrington Ward's series[1] of 359 cases, operative treatment was adopted in 310. In 1917, one case was operated upon and died; of nine cases treated medically seven died. In 1925, 54 cases were operated upon with one death (1·8 per cent.); one case was treated medically and died. In 1927, 25 cases were operated upon, only one child dying (4 per cent. mortality); no case was treated medically. In Poynton's[2] series of 100 cases there were 20 deaths, a mortality of 20 per cent. In the present series of 18 cases, all five patients treated medically recovered, while among the remaining 13 treated by Rammstedt's operation there were three deaths.

Wolff,[3] of Eisenach, gives a series of 98 cases from 1912 to 1930. Of these only six were operated upon, and among the 92 treated medically there were only two deaths. These are truly remarkable figures and form an interesting contrast with the method of treatment and results obtained in this country.

Ætiology.

In three patients the symptoms began at or soon after birth. In the remaining 15 the average age of onset was 3½ weeks, the earliest being 12 days and the latest 5½ weeks. There was the usual preponderance of males, all but one being of this sex. G. F. Still drew attention to the frequency with which first children are affected. In 299 cases in Barrington Ward's series, 171 (57 per cent.) were first children of the family. In the present series of 17 male children, eight (47 per cent.) were in this category.

Although *phimosis was at one time* considered to play a part in the production of the condition, *it is difficult* to understand its influence. Of 17 patients, four were Jewish and circumcision had been performed on the eighth day. In two other cases circumcision had been performed on the ninth and eleventh day respectively. Amongst the remaining 11 cases, phimosis was said to be present in four only. In one of these, circumcision and medical treatment led to a complete cure without operation. In another, circumcision was performed at the same time as the Rammstedt operation. Of 12 patients still living, five are uncircumcised. These findings suggest that phimosis was not an ætiological factor.

In none of the cases was there any relationship between the parents. All except two of the children were breast-fed from birth for varying periods before other preparations were tried. One of these two was fed on Allenbury's Food No. 1 up to the time of onset of symptoms. The other was fed on Nestlé's Milk, as "he did not take to the breast."

Symptoms.

Of the symptoms, vomiting was the most important. In 14 cases it was forcible or projectile in character. It usually occurred immediately after each feed, but occasionally after every third, fourth, or fifth feed, and rarely were all feeds vomited together at the end of the day.

The forcible nature of the vomiting was very characteristic, and was described variously as being projected from 2 ft. to 3 ft. "right over the mother's clothes" or "over the side of the cot." In other cases it was described as being "just pumped up all at once," "whole of feed returned through mouth and nose as if pumped up," and "spout out as from a water tap." In three cases no note was made as to the character of the vomiting, and in one case it was not projectile and "just ran out of his mouth" at first once a day, then twice or three times, and then almost after every feed.

In three cases there had been slight vomiting after food from birth. In two of these it was said to be projectile in character.

Constipation was present in 14 cases and became marked when vomiting commenced, or shortly afterwards. Rarely constipation preceded the vomiting. In four cases it was absent, the bowels acting regularly or freely after each feed. Green stools were present in seven cases.

Wasting was present and usually marked in all cases. In 14 children in whom the birth-weight is known nine on admission were under the birth-weight. This drop in weight varied from 1 oz. to 1 lb. 10 oz., with an average of 10 oz.

Jaundice was present in one case for one week before admission, but had almost disappeared at the time of operation. The Wassermann reaction was negative.

Physical Signs.

A *pyloric tumour* was palpated in 11 of the 18 cases. In four patients *no note* was made as to whether a tumour was present or absent. All four were operated upon and a tumour found. In three cases palpation of the abdomen failed to detect any tumour. Only one was operated upon and a definite tumour was found at the pylorus.

In these patients, where a tumour was detected, it was usually found just above and to the right of the umbilicus. Occasionally it will be found rather far to the right, almost in the right lumbar region. The position of the tumour is not constant and may vary in place from time to time as a wave of peristalsis passes over it. As this wave reaches the pylorus it may be felt to contract and harden. In one case it was noted that the liver reached a distance of three fingers' breadth below the costal margin; this relative enlargement of the liver is common and partly accounts for the difficulty in detecting the tumour.

Visible gastric peristalsis was a prominent sign in 14 cases. In the remaining four it was, in all probability, also present, although no note was made to this effect. The abdomen is uncovered and watched during a demonstration feed. The wave appears as a large rounded ball near the left costal margin, passes across the epigastrium from left to right, and ends as a smaller rounded ball, as a rule just above and to the right of the umbilicus, but depending on the position of the pylorus. The rate is usually fairly rapid.

Medical Treatment.

This commenced with a glycerin *enema* ʒ *iii*, which was usually repeated in four to five days and then as often as necessary. Gastric lavage with a sodium bicarbonate solution ʒ i in a pint of boiled water was employed at first either twice or three times a day, reducing later to once a day, and finally omitting altogether about five to six weeks after commencing treatment.

Method of feeding.—One child was breast-fed throughout with supplementary feeds of citrated milk at night. Thirteen days after admission a phimosis was dealt with by "slitting up" of the prepuce, and vomiting occurred on only three occasions afterwards, and in three weeks the child had gained 5 oz. There was a final gain in weight of 14 oz. during a stay of seven weeks. Artificial feeding was employed in the other four children, e.g., as follows:—

Peptonised milk ℥ iss and boiled water ℥ss were given two-hourly by means of a stomach-tube. As an alternative albumin water ℥ii may be given. These were replaced subsequently by the same quantities of citrated milk and boiled water given at first by the stomach-tube, then by spoon, and finally by bottle. The amount was gradually increased until citrated milk ℥v was being given three-hourly.

Drugs.—In one case tinct. opii ♏ i with haustus bismuthi ʒ i was given six-hourly for diarrhœa with green stools. In another the following drugs were employed: tinct. belladonn. ♏ iii, tinct. camph. co. ♏ ii, and sodium bicarb. grs. iii. In all five children the vomiting gradually diminished, and finally ceased altogether. In one child visible gastric peristalsis continued, and had not completely disappeared on discharge from hospital. This child gained 5 lb. 8 oz. in five months. The other children gained 2 lb. 8 oz. in three months, 1 lb. in five weeks, and 14 oz. in two months, respectively.

Although constipation was a marked feature in all, the bowels became regular during treatment, two to three motions occurring every day.

Surgical Treatment.

PRE-OPERATIVE.

Although operation is undertaken as soon as possible after the diagnosis is made, at least 24 hours are required to prepare the child. It is usually performed on the first, second, or third day after admission. One child succumbed in which operation was delayed for 32 days after admission.

Twenty-four hours before operation enemata 3 oz. of normal saline with 5 per cent. glucose are commenced and repeated six-hourly. The child is breast-fed, if possible, every three hours until four hours before the time of operation, after which nothing further is given by the mouth. The last two feeds are given with a teaspoon. Subcutaneous saline 1½ oz. to 3 oz. with 5 per cent. glucose, is given into each axillary region 12 hours before and again two hours before operation into the thighs. Finally, 1½ hours before operation, the stomach is washed out with plain water, and the limbs are wrapped in warm cotton-wool and lightly, but firmly, bandaged from below upwards. Gastric lavage is beneficial for the associated gastritis, and relieves the distension, which adds to the difficulties of the operation. Subcutaneous salines and glucose restore fluid to the body and carbohydrates to the liver. A blood transfusion may be necessary. Absolute rest is maintained for one hour before operation.

No hypodermic injection is now given before the anæsthetic, although in most of the cases in this series atropine gr.1/200th was given half an hour before the time of operation. The child wears a woollen vest and a flannel gown, and is carried to the theatre in a warm blanket; one or more well-protected hot-water bottles may be placed between the folds under the child. It is most essential that the theatre and instruments necessary for the operation are ready before the child is brought from the ward, so that there is no waiting. The theatre staff should each know exactly what they have to do, being ready with lotions, porringers, &c., at the right moment to prevent any waste of time. The temperature of the theatre is an important point, and should be between 75° and 80° F. The table should be previously warmed by means of hot-water bottles.

The *anæsthetic* is given in the theatre with the child on the table. The choice of anæsthetic is important.

From 1924 to the end of 1927 six cases were operated on, and in two of them open ether was employed. One developed broncho-pneumonia on the eighth day, but eventually recovered; the other recovered without chest complications. In three cases chloroform and ether were used, and of these two died. One died the day after operation. The vomiting persisted, and at the post-mortem examination a small area of broncho-pneumonic consolidation was present at the right base. The other child died two days after operation; definite signs of consolidation developed at the left base. In one case no note was made as to the anæsthetic employed.

From 1928 onwards seven cases were treated by operation. In all cases gas and oxygen was given through a Boyle's apparatus. In some cases a little ether was added to the mixture. None of the children developed chest complications.

Gas and oxygen is undoubtedly the anæsthetic of choice, and the addition of a little ether at the same time does not appear to increase the danger to any extent. A specially small face-mask is necessary.

THE OPERATION.

Only the site of the operation is exposed. A paramedian incision, 2 in. to 2½ in. long is made high up to the right of the mid-line beneath the costal margin, the advantage of this high incision being that it allows the liver subsequently to protect the abdominal wound; this organ presents itself when the peritoneum is opened, and should be gently lifted up.

The pyloric tumour is delivered, and care is taken to prevent coils of small intestine or of transverse colon from protruding through the wound; the tumour is steadied, and held by the left forefinger and thumb. An incision is made through the peritoneum and superficial muscle-fibres at the junction of the upper and middle thirds of the anterior surface of the pylorus—this being a comparatively avascular area, the meeting place of the superior and inferior pyloric veins. On the one hand this incision extends as far as the duodenum, but not on to it, and, on the other, to a varying extent along the pyloric portion of the stomach. It should be remembered that the pylorus projects somewhat into the duodenum, and great care must be taken not to open the duodenum. The deeper layer of muscle is separated down to the mucous membrane with a blunt dissector or the handle of the scalpel, until the mucosa appears white and glistening and may bulge to some extent. The stomach may now be compressed, and air forced through the pylorus into the duodenum. In this way it may be possible to detect any injury to the mucosa; if the latter has been accidentally incised it must be sutured at once with fine catgut, and if it is thought necessary a piece of omentum sutured over it. The pylorus is returned, and the incision in the abdominal wall should be carefully but quickly closed in layers. The child is carried back to the ward, well wrapped up in a warm blanket, which should also cover the head.

The time taken for the operation was noted in four cases—viz., 6 minutes, 12 minutes, 15 minutes, and 23 minutes; in four, an accidental incision was made in the duodenal mucosa, which was sutured with fine catgut; all four children recovered.

During the operation the cot must be prepared. A hot-water pillow, freshly filled at a temperature of 118° F., is placed under the drawsheet, a folded blanket is in readiness to cover the child, and a small knee-pillow is placed in position. The remaining bedclothes are hung over the electric cradle, protected by a rough brown blanket. The foot of the cot is placed on blocks, and a screen arranged around it. Oxygen and brandy, and the wagon for subcutaneous and rectal salines, must be in readiness.

POST-OPERATIVE CARE.

On return from the theatre the child is placed in the cot, well protected from the light bulbs by the second blanket. The temperature and pulse-rate are taken hourly for 24 hours. If the temperature is rising, the limb bandages are removed. If it continues above 100° F., the electric cradle is removed; if above 101° F., a cold compress is given to the head, and if above 102° F., an ice-bag is applied almost touching the head. The water-pillow is filled every six hours, and feeding is begun four hours after operation. If the condition of the child is poor, rectal saline ℥ i to iii with glucose ℥ss should be given four-hourly, and, if necessary, subcutaneous saline with glucose ℥ iss into each axilla.

Feeds.—Begin four hours after operation.

4th	hr.	after	op.	hourly	feeds	of	1	dr.	for	6	feeds	from	spoon.
10th	,,	,,	,,	,,	,,	,,	2	,,	,,	3	,,	,,	,,
13th	,,	,,	,,	,,	,,	,,	3	,,	,,	3	,,	,,	,,
16th	,,	,,	,,	,,	,,	,,	4	,,	,,	3	,,	,,	,,
19th	,,	,,	,,	2-hourly	,,	,,	6	,,	,,	3	,,	,,	,,
25th	,,	,,	,,	,,	,,	,,	1	oz.	,,	3	Breast.	,,	Test feed.
31st	,,	,,	,,	,,	,,	,,	1½	,,	,,	6	,,	,,	,,
43rd	,,	,,	,,	,,	,,	,,	2	,,	,,	6	,,	,,	,,

3rd day. Further increase in feeds, return to three-hourly and night intervals, depending on condition of child.

The child is always breast-fed, if possible. Of the ten cases that survived seven were breast-fed.

Temperature.—In all the cases there was a marked rise of temperature immediately after the operation; it was not uncommon for the temperature to rise to 103° to 106° F. in the evening. On the first day a temperature of 102° or 103° F. was usual, rising to 105° F. on the second day. On the third day a gradual fall in temperature began; in two cases it was normal on the second day, and in another two normal on the third day; in the remaining six the temperature gradually subsided, and became normal and steady between the sixth and eleventh days.

Vomiting.—In no case was there projectile vomiting after the operation. In three cases no vomiting occurred at all; in the remaining ten cases there was some vomiting during convalescence. This commonly occurred at two distinct periods: (1) on the first, second, and third day after operation; (2) on the ninth to the fourteenth day. In none of these cases was there any vomiting in the intermediate period or later than the fourteenth day.

Bowels.—Enemata may be required after operation. As a rule they are unnecessary, as the bowels begin to act freely, four to five motions being passed for a few days after operation. On discharge, the child is generally passing two or three motions a day.

Weight and length of stay.—Where convalescence was uninterrupted, in eight cases the average gain in weight on discharge was 15 oz. for an average length of stay of 19 days after the operation. The actual gain in weight varied from 5 oz. to 2 lb., and the length of stay from 15 days to 24 days after operation.

MORTALITY.

Among the 13 cases operated upon there were three deaths.

One child was a very small, undersized, and thin baby of seven weeks, weighing 6 lb. 15 oz.; it had not been breast-fed. On admission gastric lavage was commenced, and continued daily, with some improvement. Operation was performed 32 days later. The anæsthetic employed was chloroform and ether, and the time taken for the operation was 15 minutes.

Subcutaneous salines were given afterwards, but the vomiting persisted, and the child died the next day. Post-mortem, the body-weight was found to be 5½ lb. The pyloric sphincter had been completely divided down to the mucosa, which was found intact and appeared healthy. There was a small amount of clotted blood around the incision in the pylorus. A catheter could be passed readily into the duodenum. There was a small area of broncho-pneumonic consolidation at the right base. All the other organs appeared healthy.

The second fatal case was three weeks old on admission and weighed 7 lb. 12 oz. Operation was performed two days later under chloroform and ether. Death occurred on the second day, signs of consolidation developing at the left base. From the time of the operation until death the child took its feeds regularly and did not vomit.

The third child was three weeks old on admission, and weighed 7 lb. 8 oz. It was noted that the face was a little drawn, the skin somewhat lax, and the fontanelle slightly depressed. Infection of the wound occurred on the second day and suppuration on the fourth day; on the sixth day the stitches gave way, and the wound gaped. Vomiting continued, and wasting set in. The child became collapsed, and died 26 days after operation. No post mortem was granted, but a limited examination of the abdomen was made through the wound. There was a large amount of pus pocketed in the lower part of the abdominal wall, and also in the lower part of the abdominal cavity, shut off by adhesions from the general peritoneal cavity. The lower part of the small gut and greater omentum were involved, and the small gut was distended and inflamed. The stomach was very hypertrophied. The incision in the pylorus was satisfactory, the mucosa being intact and healthy, and there was no sign of inflammation. It is interesting to note that in this case the skin had been prepared with ether and flavine, owing to a rise of temperature following the application of iodine four days previously.

After-results.

Of the five cases treated medically and recovering, three have been traced. In none has there been any vomiting since discharge from hospital. There has been no indigestion or abdominal pain, and the bowels are quite regular. In all three the general health has been excellent. Of the ten cases which survived operation nine are alive and well, but one child died seven months after operation.

He progressed extremely well up to the time of weaning at six months, and weighed 17 lb. He then began to vomit between feeds, diarrhœa set in, and he rapidly went downhill, dying about three weeks later. A note kindly sent from the hospital where he died stated that "on admission he was very ill; eyes were sunken, skin dehydrated, vomiting after feeds but not projectile, stools green; no abdominal tumour felt. The temperature was raised and the pulse was rapid and thready. A diagnosis of infective enteritis was made. The child did not respond to treatment, and died two days after admission. At the post-mortem examination the stomach was rather large, the pylorus thicker than normal; there was a scar ¾ in. long on the anterior surface on its lower half. On opening the stomach some milk was found, but there was no apparent contraction of the pylorus. The stomach mucosa was infected in places, and there were a few adhesions of omentum around the organ; the intestines were apparently normal in appearance."

From the history, it would appear that death was due to infective enteritis, occurring after weaning. The mother sent a photograph of an extremely healthy looking child taken two weeks before death.

The remaining nine cases are strong, healthy children. Of these, seven have had no digestive symptoms at all since the operation. One child suffers from flatulence, and has indigestion on occasions. At the time of weaning he had "bilious attacks" accompanied by vomiting. The other child had attacks of vomiting every two or three weeks for two years after operation; these were accompanied by loss of weight and constipation.

The mothers volunteered the statement that "the children were very advanced for their age," and proudly brought or sent photographs. Most of the children were breast-fed after the operation, and in all the wound had healed well and there were no herniæ. No tumour could be felt in any of the cases.

A comparison of the present weights of 13 children in the series and the weights of average male children of the same age period (Feldman[4]) shows that all except one of the children are over the average weight.

I am indebted to the physicians and surgeons of the Middlesex Hospital for permission to use the notes of cases under their care. My thanks are also due to the ward and theatre sisters for the nursing details.

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CLINICAL AND LABORATORY NOTES

PROLONGED ANURIA IN A WOMAN FOLLOWING PYELOGRAPHY.

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IT had been decided to perform pyelography to attempt to discover the cause of abdominal pain, shooting to the left side, accompanied, according to the patient (a woman of 52 years), by some frequency of micturition when the pain was severe. The pain had been troublesome for six weeks. There was no difficulty in the passage of the cystoscope or of the ureteral catheters. The bladder was normal.

Sodium iodide (15 per cent.) was used for the pyelogram; 8 c.cm. were injected into the left pelvis, which was photographed, and then this side was drained, and 6 c.cm. were injected into the right pelvis. The pyelogram showed normal pelves.

Next day the patient passed 25 oz. of urine, slightly blood-stained, and on the second day only 10 oz. were passed. From the third to the seventh day no urine was secreted. During this time she was treated by hot packs, pilocarpine injections, and purgatives; she perspired freely, and her bowels acted well. She felt well in herself until the sixth day when she complained of "heaviness." She vomited small amounts several times each day, but had no headache and was mentally quite alert. On the fifth day the right kidney became palpable. Dry cupping was performed. On the seventh day the left kidney was palpable. The bladder was catheterised on the fifth day but contained no urine. On the seventh day the blood-urea was 122 mg. per 100 c.cm. of blood. Our colleague, Dr. E. G. B. Calvert, who kindly saw the case with us, advised a venesection and accordingly 12 oz. were withdrawn about midday. That evening some six hours later some 6 oz. of urine, deeply blood-stained, were passed, followed by another 6 oz. at 9 P.M. and 4 oz. at 10.30 P.M. On the eighth day she passed 73 oz. containing much blood, and the pathological examination showed pus cells, staphylococci and *Bacilli coli communis* (not a catheter specimen). On the ninth day more than 34 oz. were passed with which was a ureteral clot of blood some 3 inches long. The blood-urea was now 157 mg.

From now she made an uninterrupted recovery, the urine became clear, and in another ten days the blood-urea had fallen to 29 mg. per 100 c.cm. blood. Throughout this time the temperature did not rise above 99·2° F. and generally was normal; the pulse-rate varied between 100 and 120 for the first three days, then remained under 100.

We are indebted to Dr. H. H. Sanguinetti for the examination of the urine and estimation of blood-urea.

THE CRITERIA OF CURE IN PULMONARY TUBERCULOSIS.

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THE following cases are recorded for their interest in relation to prognosis, and to the definition of "cure" in pulmonary tuberculosis.

CASE 1.—A. B. first received treatment in June, 1922, when she was aged 13 years. Her father had recently died of pulmonary tuberculosis, and she came under suspicion on account of a cough and a mild pyrexia. When she was first examined the percussion note was found to be slightly impaired at the left apex, where also the breath sounds were harsh and a few fine râles were heard. Examination of the scanty sputum was negative for tubercle bacilli. She was sent away to a sanatorium, where the pyrexia and râles subsided in a few weeks, and whence she returned home apparently recovered in April, 1923. Her lesion gave no signs of activity during the next five years; she continued to gain in weight, was not troubled with cough, and was afebrile on every occasion but one when she was seen; on that occasion the temperature was 99° F., and she was suffering from coryza. It was thought that she might soon be considered cured. However, in May, 1928, she came up on account of a "cough following a cold," and because she also felt generally unwell. She said that she had coughed up a clot of blood.

Examination of the chest revealed the presence of râles at the left apex, and tubercle bacilli were found in the sputum. A stay in hospital, followed by six months in a sanatorium, brought about an improvement in her condition, but on her discharge tubercle bacilli were still to be found in the sputum. She remained fairly well, and was able to keep on with her work during the next 18 months, but then she began to lose ground again; there were signs of involvement of both lungs, and hoarseness and dysphonia indicated spread of disease to the larynx, in which laryngoscopy revealed unmistakable signs of a tuberculous lesion. She died in July, 1931.

CASE 2.—C. D., a magneto repairer, was aged 15 when first seen in March, 1920. On examination he was found to have signs of slight involvement of both upper lobes, some pleural friction was heard low down in the left axilla, and his sputum contained tubercle bacilli. His weight was 7 st. 5¾ lb. He gave a history of having had pleurisy on the right side three years previously. In June, 1920, he went away to a sanatorium, where he stayed until October, 1921. During this time he improved considerably; his weight rose to 9 st. 12 lb.—although, of course, normal growth accounted for some of this—and on return the lesion was apparently quiescent, as the temperature was normal, no râles were to be heard, and there was no sputum. He then returned to work, at which he remained until September, 1930.

When he was seen from time to time at the dispensary there was nothing to suggest activity of his disease, but he occasionally suffered from coryza. He complained from time to time of pain in the right hypochondrium, but this was apparently due to dyspepsia. At the end of 1926 he was told that he might consider that he had recovered, although he should still be careful in his mode of life. His weight was then 10 st. 10 lb. He was a sensible type of patient, and there is no reason to think that he behaved otherwise than carefully.

In March, 1930, he returned on account of pain on the right side of the chest, and cough. There were no adventitious sounds in the lungs, but the temperature was 99° F., and, in April, 100° F. Sputum reappeared, but no tubercle bacilli were found. By the end of April this attack had apparently subsided, he became afebrile, began to put on weight again, and went back to work. By August, 1930, his weight had risen to 10 st. 12½ lb., which was the heaviest he had ever been. At the beginning of October he suddenly had a hæmoptysis of about half a pint, and took to his bed. During the next few days there were several more hæmoptyses, and signs of broncho-pneumonia appeared, chiefly on the right side, with tubercle bacilli in the sputum. He went rapidly downhill, had several more hæmoptyses, and died on Nov. 17th. At the post-mortem examination old tuberculous lesions with multiple small cavities were found at the apices of both lungs. The pleura was thickened at both apices, and there were adhesions throughout the right pleural cavity. There was a recent tuberculous bronchopneumonic spread throughout the middle and lowest lobes on the right side, and to a slighter extent in the left lower lobe. The hæmorrhages appeared to have come from the left apex, where blood clot was found.

CASE 3.—E. F., was aged 61 when first seen in April, 1925. He was then complaining of a slight cough, which appeared to be due to chronic pharyngitis. There were signs compatible with the presence of an inactive lesion at the apex of the right lung, but otherwise, except for some emphysema, the lungs appeared to be normal. Sputum was scanty, and no tubercle bacilli were found in it. He gave a history that in 1907 he had suffered from tuberculosis of the right lung, and had had part of his epiglottis removed for tuberculous disease. After he had spent six months in a sanatorium his disease was considered to be quiescent. It was not known whether tubercle bacilli had been found in his sputum.

From then until 1918 he remained in good health, and during the war was fit enough to be employed on home service as an officer in the army. In 1918 he had an attack of "pleurisy," from which he apparently made a complete recovery. In earlier life he had been an officer in the Regular Army, had seen service in India and South Africa, and had been a good oarsman and boxer. After leaving the army in 1905 he had gone into business in the City. There was no history of any illness of any significance before 1907. In the winters of 1925–28 he had occasional pyrexial attacks, accompanied by signs of a mild bronchitis and some pharyngitis. No tubercle bacilli were discovered in the sputum, but the organisms most commonly found were *Micrococcus catarrhalis*, pneumococci, and Friedländer's bacillus.

In 1928 he had some signs and symptoms pointing to the possibility of carcinoma of the colon, but a thorough investigation of the alimentary tract failed to reveal any abnormality except colonic stasis. In October, 1929, he was suddenly seized with what was taken to be an attack of influenza. Signs of broncho-pneumonia soon appeared in both lungs; the temperature, pulse-rate, and respirations rose to 102° F., 120, and 36 respectively, and he died on the fifth day of the illness. On this occasion tubercle bacilli were found to be present in the sputum.

Prognosis in tuberculous disease is notoriously difficult; and the would-be prophet has more than once been assured on good authority that he can be certain of only one thing—that his prophecy will be wrong. The diagnosis, and even the definition of "cure," are equally difficult, in spite of all the indications given to the contrary by favourable reports on the various specifics which follow one another in endless succession through brief notoriety to obscurity. The definition officially adopted in this country by the Ministry of Health is that a patient should not be considered as cured of pulmonary tuberculosis until five years have elapsed without any manifestations of active disease. Experience—as witnessed by the first two cases here recorded—shows this definition to be none too stringent. A definition which suggests itself as theoretically admirable—though of doubtful practical value—is that the term "cured" should be applied to the patient who attains the normal expectation of life from the beginning of the quiescent period. Perhaps, in view of the third case recorded above, the only safe prognosis is a variant on that favourite reflection of the Greek dramatists on the insecurity of human happiness—Call no man cured until he is dead.

BRITISH MEDICAL ASSOCIATION.

ANNUAL MEETING IN EASTBOURNE.

SECTION OF MEDICINE.

At the second session of this section Dr. A. Deane (Vice-President) took the chair, and a discussion on

Varieties of Secondary Anæmia and their Treatment

was opened by Dr. L. J. Witts. Analysing the causes of secondary anæmia he emphasised the importance of a group of cases occurring chiefly in women of reproductive age in which none of the usual causes was present, and which formed a distinct clinical entity for which he suggested the name of chronic microcytic anæmia. Twenty-six per cent. of the cases of anæmia admitted to Guy's Hospital during a three-year period he had found to belong to this group, 86 per cent. of these occurring in women. A study of the age-incidence showed a steady increase to a maximum between the ages of 40 and 49, and then a sudden fall. Individual cases might show spontaneous improvement after the menopause. Age- and sex-incidence were, therefore, different from those of pernicious anæmia and achlorhydria. Women affected were found in all classes of the community, but they often showed signs of an asthenic diathesis and gave a history extending back into childhood of intestinal dyspepsia and nervous instability. Clinically, the group was characterised by an anæmia with low colour-index, about 0·5, showing red cells with a diminished diameter and slightly increased fragility. The van den Bergh reaction was negative, the bilirubin and free iron content of the plasma being diminished. The spleen was palpable in one-third of the cases. The bone-marrow showed a normoblastic hyperplasia which on treatment gave way to normal red cell production. Achlorhydria was present in 81 per cent. and glossitis in at least 50 per cent. of cases. These inflammatory changes in the mouth sometimes extended back into the pharynx causing dysphagia. A spoon-shaped deformity of the nails was also common.

The condition, he found, was most likely to be confused with splenic anæmia. The latter, however, was seen commonly in young adults, and showed greater splenic enlargement, while the patient might give a history of jaundice and hæmorrhage. The fingers also showed slight clubbing as opposed to the spoon-shaped nails so characteristic of chronic microcytic anæmia. The frequency of achlorhydria which, as far as his evidence went, was present before the anæmia developed led him to emphasise its possible importance in the ætiology of the disease. He had found massive doses of iron by mouth extremely effective in treating the anæmia. Small doses of iron or injections of iron were useless. He regarded grs. 60 of iron ammonium citrate or grs. 30 of Blaud's pill as minimum doses. Treatment had often to be continued for three months with these large quantities in order to reach a hæmoglobin of at least 80 per cent. and small doses in many cases had to be given indefinitely to prevent relapse. Transfusion was temporarily effective but relapse always followed, and unexplained fatalities might occur in spite of careful direct matching of the blood. Liver, liver extract, desiccated stomach, hydrochloric acid, and splenectomy he had found valueless.

Prof. Stanley Davidson reported satisfactory results in treating a miscellaneous group of cases with large doses of iron. It had been possible in one case of carcinoma of the colon to bring the hæmoglobin level back to normal, and he treated all cases of secondary anæmia associated with new growth intensively with iron for three weeks before operation, raising the hæmoglobin 30 per cent. in this way.

Dr. Janet Vaughan classified secondary anæmias as deficiency diseases dependent upon the lack of those substances essential for normal blood production—i.e., an adequate supply of iron, two factors present in whole liver, one of which was also present in liver and stomach extracts, vitamin C and a factor probably associated with the vitamin B complex. The deficiency might be brought about by faulty diet, failure of absorption or digestion in the alimentary canal, or excessive loss from the body. She quoted her own and other observers' cases to show that idiopathic microcytic anæmia, anæmia secondary to acute and chronic hæmorrhage, and the simple anæmia of infancy responded well to massive iron dosage. She showed that anæmia secondary to chronic hæmorrhage, starvation, deficient dietary in children, past sepsis, and carcinoma was relieved by whole liver combined with adequate iron, anæmia in association with scurvy by vitamin C. The anæmia of chronic myeloid leukæmia had been improved by large doses of arsenic. She emphasised the necessity of adequate dosage of iron and liver, suggesting that Blaud's pill should be given in powdered form to ensure utilisation; grs. 60 of Blaud's pill and ½ lb. of liver a day being minimum rather than maximum quantities. Liver extracts, stomach extracts, and the factor associated with the vitamin B complex had only been found of value in treating macrocytic anæmias.

Prof. H. F. Moore described a series of cases of idiopathic microcytic anæmia which reacted well to massive iron therapy. He had found achlorhydria common in both diabetes and hyperthyroidism.

In the ensuing discussion Dr. A. V. Clarke said he had found insulin, 20 units twice a day, in conjunction with glucose, valuable in treating severe anæmia. One case of pernicious anæmia unable to take liver or ventriculin had responded to raw beef incubated with gastric juice. Dr. George Graham emphasised the value of ferrous as opposed to ferric salts. Dr. E. P. Poulton said that Dr. A. F. Hurst had been the first person to appreciate the value of massive iron therapy in this country. Dr. Frewen Moor had found ultra-violet light valueless unless the anæmia improved after the first three applications. Dr. R. C. Hutchinson mentioned a case of obstinate varicose ulcer which healed after he had given iron for the associated anæmia, and also a case of high blood pressure associated with anæmia when the blood pressure fell to normal on recovery. Dr. John Eason considered that anæmia associated with syphilis responded well to antisyphilitic treatment. He believed many cases of chronic microcytic anæmia were associated with hypothyroidism. Dr. William Russell as early as 1880 had given as much as grs. 180–200 of Blaud's pill with satisfactory results. Dr. R. A. Young instanced cases where small doses of copper gr. ⅛ had improved the anæmia. Dr. Rupert Waterhouse asked if there was any knowledge of variations of blood volume in secondary anæmias. Prof. A. Rabinowitz (New York) said he had found severe anæmia in acute nephritis associated with œdema and in chronic nephritis associated with nitrogen retention. The latter was sometimes macrocytic in character and responded well to liver therapy.

In reply, Dr. Witts mentioned two cases of simple achlorhydria anæmia which had progressed to pernicious anæmia and one in which the reverse had occurred. He had found the ferrous salts ten times as effective as the ferric salts and that iron in pregnancy anæmia was not always of value. None of the cases in his series had shown signs of myxœdema, the basal metabolic rate being normal. The incidence of microcytic anæmia was, in his opinion, unaffected by environment. He did not believe there were any reliable data concerning blood volume changes in secondary anæmia.

SECTION OF DISEASES OF CHILDREN.

At the third session of this section, the chair was taken by Dr. E. H. Rainey, and a discussion on the recognition and treatment of

Birth Injuries in the Newly Born

was opened by Prof. G. B. Fleming. While emphasising the remarkable recuperative powers of an infant suffering from the traumas of birth as contrasted with its poor resistance to infection, he pointed out that apparently about 30 per cent. of all neonatal deaths were due to birth injury. His paper was based on 350 cases of birth injury among approximately 8000 consecutive infants born alive at the Royal Maternity Hospital, Glasgow. He proposed to devote his remarks only to two groups of cases. Injuries of the infant's *skin and subcutaneous tissues* occurred even in normal labour, and sloughing or infection might cause trouble when the damage to these tissues was more severe. Cellulitis was not uncommon in breech presentations with much bruising and œdema. Injuries to the *nervous system* were the most serious of birth injuries and the most likely to leave permanent disability, though here again the infant's recuperative powers were remarkable. Injuries to the peripheral nerves other than the facial (66 cases in the series) and the brachial plexus (28 cases) were rare; injuries of peripheral nerves of the lower limb might be extremely difficult to differentiate from damage to to spinal cord. Rapid recovery in one to two weeks was the rule in facial paralysis. The early recognition and treatment of brachial paralysis was important, for the earlier the treatment the better the result. Till a satisfactory splint was made the affected limb should be fixed to the pillow with a piece of adhesive plaster round the wrist and a safety pin, the arm being suitably abducted and externally rotated, and the forearm flexed to a right angle and supinated. In very few cases was an attempt at nerve suture advisable. Injury to the spinal cord was commonly produced during breech extractions, and in fatal cases it was usually unrecognised. If the child survived, the symptoms were those of a transverse myelitis. Intracranial hæmorrhage was extremely common; Cruickshank in 800 neonatal autopsies found gross hæmorrhage in 20 per cent. It was extremely difficult to diagnose with certainty during life, but signs pointing to the condition were drowsiness, feeble cry, inability to suck, muscular rigidity, convulsions, bulging fontanelle, and intermittent cyanosis. Dr. Fleming considered that a definitely pigmented or uniformly blood-stained cerebro-spinal fluid with crenated blood-cells was probably the most important manifestation available, but did not afford absolute proof. The fluid should be centrifuged as soon after withdrawal as possible to note any yellow pigmentation. Treatment should be symptomatic: careful nursing, and feeding with the stomach-tube if necessary; if there was increased intracranial pressure lumbar puncture, or in some cases where intraventricular bleeding was suspected, ventricle puncture was required. For convulsions chloral hydrate gr. 1 might be given two-hourly. In 33 cases followed up by Dr. Fleming and Dr. E. D. Morton for a year or more, five were mentally deficient: of these, four had spasticity of one or more limbs, one had spastic diplegia, and one hydrocephalus.

Dr. N. B. Capon welcomed the choice of birth injuries as a subject for discussion at the section, for it showed that the care of the new-born child was coming into the domain of the pædiatrician. He believed that this would give the infant a better chance, for the obstetrician must of necessity be preoccupied with the mother rather than with the child. The appointment since the war of pædiatricians to the staffs of some maternity hospitals was an important advance. Public attention was at present concentrated on the maternal death-rate, but though the maternal deaths in England and Wales in 1929 were 2787, the deaths of infants in the first month of life numbered over 21,000, and probably over 7000 of these babies suffered from birth injuries of one sort or another. Of the fatal cases of intracranial trauma nearly half had no gross hæmorrhage, and death appeared to be the result of congestion, concussion, or œdema. The clinical differentiation of these different types of trauma had up to now proved very difficult, though the prognosis was not the same. If there was no hæmorrhage and recovery occurred, it would probably be complete; with hæmorrhage there might be after-effects such as hemiplegia or other evidence of permanent damage to the brain, though here again the majority of survivors appeared to be normal. In the differential diagnosis between intracranial trauma and such varied conditions as inanition fever, pneumonia, poisoning through maternal toxæmia, and congenital abnormality of the brain, attention should be directed to the following points: the type of labour, whether the infant is immature, whether the infant shows cyanosis or pallor, failure of the sucking reflex, character of respiration, and abnormal somnolence or excessive crying. The prevention of trauma was a problem for the obstetrician, treatment concerned the pædiatrician. Whether or not lumbar puncture should be done in any individual case was difficult to decide, since on the one hand these infants were often in a state of surgical shock and harm might be done by puncture, and on the other a case of excessive intracranial pressure would die if unrelieved, and the state of the fontanelle did not give the guidance one might expect. He himself used in the past to do more punctures than he now did.

Dr. A. Bennett agreed about the frequency of intracranial hæmorrhage, but pointed out that the small hæmorrhages discovered post mortem were very often not the cause of death. She suggested the desirability of giving intramuscular citrated blood injections. Dr. Donald Paterson and Dr. H. M. M. Mackay further discussed the difficulties in the diagnosis of intracranial trauma, and also advocated the more extensive trial of intramuscular injections of blood at as early a stage as possible. Dr. C. F. Harris inquired whether Prof. Fleming had tried increasing the carbon dioxide intake, combined with extra oxygen, in cases of difficult breathing. If the respiratory centre was injured this method of stimulation of the centre might tide the infant over the first few critical days. Dr. A. A. Moncrieff had been experimenting on animals with carbon dioxide and lobeline for the stimulation of respiration, and considered both agents valuable in the cases under discussion.

Prof. **FLEMING** replying said he had not seen harm result from lumbar puncture in cases of birth injury. He was against stimulating a damaged respiratory centre by the administration of extra carbon dioxide.

Congenital Pyloric Stenosis.

Mr. C. **MAX PAGE** gave an account of pyloric stenosis from the surgical standpoint, with details of the operative procedure he employed. He considered the medical pre- and post-operative treatment of primary importance, but found that drugs had little influence on the outcome. He pointed out that though in this country Rammstedt's operation was accepted as the treatment giving the best results, exclusively medical treatment was still widely used abroad without operation, and in one large series treated the mortality was only 14 per cent. Among complications of surgical treatment were: infection of the wound, recurrent vomiting—which should be rare if the operative division at the pylorus was satisfactory—hyperpyrexia, broncho-pneumonia, and gastro-enteritis. In 60 cases operated on by Mr. Page at the Victoria Hospital for Children, the mortality was only 6·6 per cent., whereas with the same operation and, so far as he could determine, the same treatment at St. Thomas's his operative mortality was approximately double.

Dr. **NOAH MORRIS** gave the biochemical findings obtained by Dr. Graham and himself. In pyloric stenosis, he said, there was an alkalosis with increased blood bicarbonate, and decreased chlorine in the blood and the urine. This alkalosis might occur even if there was no vomiting with the consequent loss of chlorine in the material ejected from the stomach. Correlated with the alkalosis there was depressed and slow respiration. During recovery after operation the carbon dioxide in the blood fell to normal. He suggested that the chlorine in this disease might be largely in organic combination and not combined with a base. His conclusions as regards treatment were that saline solution should be given to supply chlorine, but should not be continued until there was œdema, since this was associated with excessive retention of chlorine; that alkalis should not be given either in the form of citrates or an alkaline stomach lavage, and that if the breathing was slow and depressed a local anæsthetic should be used in preference to a general.

Dr. **PATERSON** described two unusual cases. In the first, which strongly suggested that hypertrophy of the pyloric muscle occurred during intra-uterine life, a premature baby, born at least one month before term, died ten days later with well-marked hypertrophy of the pylorus. In the second case the infant, died at 8 months old, still with symptoms of pyloric hypertrophy and stenosis, although there had been periods of remission. He pointed out that symptoms usually disappeared spontaneously in babies that survived for 16 weeks. He quoted mortality statistics derived from a series of about 600 cases. The mortality at Great Ormond-street Hospital was roughly about 1 in 4; among 24 cases operated on in private practice there was a mortality of 8 per cent., and in a series of 36 cases treated in one large nursing home there had been not one death. He attributed the great difference in mortality between hospital cases and private cases to the difference in amount of nursing care available for each baby, since the private case had at first a day-nurse and a night-nurse whose whole time was given to its care; and secondly to the fact that in hospital there was always the risk of infection from other children. He outlined his routine post-operative treatment, emphasising the importance of breast milk whenever possible. He advocated operation in all cases of pyloric stenosis when the baby was not gaining weight, unless it was already over 12 weeks old, as at about this age spontaneous recovery might be expected. No cases of hyperpyrexia occurred if atropine was not given.

Dr. **DOYNE BELL** indicated the danger of too great reliance on radiographic diagnosis in this condition. He had proved that the idea that first-born babies are especially liable to pyloric stenosis was a fallacy. Unlike Dr. Paterson he used very dilute feeds in his post-operative treatment.

Dr. **JEAN SMITH** corroborated Dr. Morris's findings. The biochemical changes, indicating an alkalosis found in pyloric stenosis were useful in distinguishing this condition from vomiting due to other causes if the clinical findings were not conclusive. If the alkali reserve was not diminished, say in two days, by the administration of saline and glucose, operation should not be further delayed, as such cases do badly on medical treatment.

Mr. **R. A. RAMSAY**, like Dr. Paterson, advocated local anæsthesia for the operation, and considered a palpable pyloric tumour was of fundamental importance in establishing diagnosis.

SECTION OF NEUROLOGY AND PSYCHOLOGICAL MEDICINE

AT the first session of this section, with Sir **JAMES PURVES-STEWART**, the President, in the chair, a discussion took place on

Cerebral Hæmorrhage Due to Other Causes than Arterio-sclerosis.

Dr. **JAMES COLLIER** pointed out that our knowledge and successful treatment of the condition had been greatly increased during recent years, chiefly owing to lumbar puncture and its almost universal application in cases presenting a picture of meningitis, of coma, of apoplexy, or of unexplained headache, and in the routine examination of the cerebro-spinal fluid in disease of the nervous system. The following list comprised the main causes of this type of cerebral hæmorrhage: injury during birth or following concussion, hæmorrhagic pachymeningitis, encephalitis, poliomyelitis, encephalitis lethargica, tuberculous meningitis, sinus thrombosis, abnormal blood states (e.g., leukæmia), anthrax infection, neoplasms, and various aneurysms, such as (*a*) infective, as in ulcerative endocarditis, (*b*) occurring in coarctation of the aorta, (*c*) occurring in polyarteritis acuta nodosa, and (*d*) the berry-like and often multiple aneurysms which have been termed congenital aneurysms. The three most important of these, however, were encephalitis, neoplasms, and cerebral aneurysms.

Many cases of encephalitis which had been confirmed histologically had been complicated by subarachnoid and cerebral hæmorrhage. Encephalitis lethargica was also of interest in connexion with the subject, for many cases of subdural, subarachnoid, and cerebral hæmorrhage from ruptured aneurysms had been recorded in which the clinical picture was hardly distinguishable from that of this type of encephalitis. Neoplasms of soft texture were also important causes of cerebral hæmorrhage, for such a growth might bring on a hæmorrhage even before the appearance of any local or general signs of tumour. Dr. Collier wished, however, to devote most of the time at his disposal to the subject of cerebral aneurysms. Such aneurysms were held to be of common occurrence, and often gave rise to no trouble during life, since at least one-fifth of the numerous specimens in museums had been chance discoveries at necropsy. They were never syphilitic in origin; the minority were due to bacteriological infections of the blood, such as in infective endocarditis, gonococcal and puerperal infections. In coarctation of the aorta, where the arterial tension above the constricted area in the aorta became extremely high when adult life was reached, the tunica media spread locally under the pressure with the formation of aneurysms, which were often multiple. They were also a feature of the curious malady first described by Kussmaul—polyarteritis acuta nodosa. The cause of the majority of the cerebral aneurysms had not yet been determined with certainty. Eppinger had termed them "congenital aneurysms," implying that they were due to a local congenital defect in the arterial wall. These aneurysms seemed to give rise to no symptoms unless they clotted up, calcified, or became adherent to surrounding structures—usually to some of the cranial nerves—or unless they ruptured. They might rupture in any situation within or upon the brain; they then produced the syndrome of a rapidly severe apoplexy, with blood in the cerebro-spinal fluid. These aneurysms had a tendency to rupture slightly and to leak slowly, after which they often healed only to leak again later on—sometimes in another situation. They might leak into the subdural space, and there form an organising hæmatoma, with a clinical picture sometimes resembling encephalitis lethargica. They often leaked into the subarachnoid space, and then most commonly produced a syndrome precisely resembling meningitis; the distinction from the latter condition was the presence of blood in the cerebro-spinal fluid and the relief produced by draining. The transient phenomena which might follow on a not too rapid and not too copious hæmorrhage upon or within the brain were very remarkable, and some of them were likely to give rise to difficulty in diagnosis, as they might occur without headache or signs of meningeal irritation. The more common of these transient signs were attacks of unconsciousness, lasting from a few hours or many days, headache resembling migraine, hemiplegia, aphasia, convulsions, delirium, pyrexia with headache, unconsciousness with albuminuria or glycosuria. The following was a short list of the regions in which an aneurysm might burst or leak: (1) transdural rupture—aneurysm of the posterior communicating artery; (2) subdural rupture; (3) subarachnoid rupture; (4) intracerebral rupture, either from a surface aneurysm, which became adherent to the brain tissue or from an aneurysm buried in the brain tissue; (5) primary rupture into the ventricle; (6) rupture of an internal carotid aneurysm into the cavernous sinus—the clinical picture being that of a unilateral pulsating aneurysm.

The treatment of subarachnoid hæmorrhage was an interesting matter for discussion, since it had been held that the repeated draining away of the effused blood in lumbar puncture increased the tendency to bleeding, though it undoubtedly relieved the symptoms for the time being. Dr. Collier's practice was always to drain freely and repeatedly so long as the symptoms of increased intracranial pressure persisted, and he had never had cause to regret this practice.

DISCUSSION.

Prof. A. J. Hall limited his remarks to subarachnoid hæmorrhage. There were several interesting features in these cases to which he would call particular attention. (1) Occasional massive albuminuria. In one of his cases in which this condition was present the kidneys were found to be normal on post-mortem examination. (2) The occurrence of Korsakow's syndrome during recovery. Although the symptoms might persist for several weeks, recovery was the rule. (3) The frequency of slight or severe exacerbations after the initial hæmorrhage. This might occur owing to the true nature of the illness not being recognised at first and complete rest not being insisted upon; on the other hand, it might also occur with the patient at complete rest in bed. (4) The occasional occurrence of convulsions during recovery. Sometimes a sudden muscular effort might determine the moment of leakage, but in others the precipitating factors were so slight as to justify the term "spontaneous hæmorrhage." Dr. Hall then cited, in illustration, certain cases of intracranial aneurysm resulting in hæmorrhage. There was also an important medico-legal aspect, in that if the leak was initiated by some strenuous act during the course of employment, or a blow, as when boxing, what should be one's attitude in assessing compensation, or in attributing the result to the blow?

Dr. W. J. Adie stated that the symptoms of subarachnoid hæmorrhage might appear without evidence of previous ill-health in patients with polycystic kidney and infective endocarditis. He thought that aneurysms leaked most often in warmer weather, and in several of his cases a diagnosis of "sunstroke" had previously been made. Premonitory headaches, resembling migraine, were common, and might occur at intervals for many years; in their most characteristic form the hemicrania was always on the same side of the head. Retinitis proliferans sometimes yielded evidence that an aneurysm had leaked in the past, and gave the clue to the cause of the symptoms in a later attack. He had also seen bilateral hæmorrhage into the vitreous, and also three cases in which herpes zoster was a complication. Recovery from the mental symptoms resembling Korsakow's syndrome was always complete.

Mr. Hugh Cairns discussed the surgical treatment of intracranial hæmorrhage, and described cases both of subdural and intracerebral hæmorrhage which had been treated successfully by operation. He emphasised the importance of small bilateral subdural explorations under local anæsthesia in every case in which subdural hæmatoma was suspected. A subdural hæmorrhage might not necessarily be localised, and might resemble a subarachnoid hæmorrhage, blood trickling down subdurally into the spinal canal, and even yielding pure blood on lumbar puncture. Mr. Cairns also described a case in illustration of the good result that could be obtained from the removal of large blood clots from within the brain itself.

Dr. J. Purdon Martin confined his remarks to hæmorrhage in relation to the dura mater. Widespread subdural hæmorrhage might be a sequel of head injury without any fracture of the cranium; it might prove fatal, or give rise to chronic subdural hæmatoma. The localising signs of the latter were often vague and deceptive. Often the blow causing the injury appeared trivial, especially in elderly subjects, and might consist merely in jerking the head. There was often a latent period of weeks or even months, or only vague and indefinite symptoms before signs of cerebral compression made their appearance. Sometimes the extravasated blood did not clot, but appeared to suffer defibrination.

Dr. J. G. **Greenfield** considered only that form of cerebral aneurysm which had been called "berry aneurysms." In his experience these aneurysms had been found most frequently in the arteries of young or middle-aged subjects who had shown either no trace of atheroma or only small isolated plaques. An abnormal arrangement of the cerebral or systemic arterial system had been commonly described in patients dying from ruptured intracranial aneurysm, a fact which constituted one of the grounds for considering a congenital malformation of vessels as the cause of these aneurysms. In an important paper published in November, 1930, Wiley Forbus had given a clear description of the true defect. He had shown that it was primarily a defect in the muscular coat of the artery rather than in the elastic coat, and had demonstrated its presence not only at the point where the aneurysm formed, but at practically every bifurcation of the cerebral vessels in these subjects. He had demonstrated such a defect also in the mesenteric vessels. Dr. Greenfield had examined the cerebral arteries in five non-atheromatous cases of cerebral aneurysm, and had found this defect present in all, whereas it was not present in two cases of intracerebral hæmorrhage of the atheromatous type. As regards treatment, the value of drainage of cerebro-spinal fluid in cases of subarachnoid hæmorrhage had been stressed by Dr. Collier, but there were some who were still opposed to this procedure on theoretical grounds, holding that reduction of intracranial pressure removed some support from the outer surface of the aneurysms. This theory had been proved to be fallacious by new knowledge on the relationship between the intracranial arterial pressure and the general intracranial pressure. Baillard and Magidot had demonstrated the fact that the pressure in the intracranial arteries rose and fell with raising and lowering of the general intracranial pressure. It had been known since the work of Cushing that rises in the general intracranial pressure up to the normal diastolic blood pressure did not cause any rise in the latter as measured in the brachial artery. But such rises automatically caused corresponding rises in the cerebral arteries, so that, whereas the pressure in the retinal artery was normally 50 per cent. of that in the brachial artery it rose to 60 or 90 per cent. of it with increase of intracranial pressure. Berens had also shown that, in even so small a branch as the retinal artery, the systolic pressure is from eight to ten times the general intracranial pressure as measured by the lumbar puncture manometer. It was therefore evident that: (1) the rise of intracranial pressure which was caused by rupture of a basal aneurysm automatically raised the blood pressure within that aneurysm, and was therefore likely to cause further bleeding; (2) that reduction of the general intracranial pressure by drainage of cerebro-spinal fluid would automatically reduce the pressure inside the aneurysm to a far greater extent than it would remove support from outside it.

Mr. A. A. **McConnell** described a case of subdural hæmatoma in a man aged 70, in whom headache appeared two days after jerking the head. In the course of a week focal symptoms—paresis of the left arm and leg—made their appearance. At no time was consciousness impaired, although cerebration was slow. Operation revealed a definite subdural hæmatoma, and the patient made a good recovery.

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Mr. **Astley Clarke** mentioned hilarity as an early and almost only symptom in a male case, aged 24, of aneurysm of the basilar artery, which ruptured and caused death. He had also seen two other cases in females, in whom laughing of an unusual character was observed as an early symptom in similar intracranial hæmorrhage.

Dr. **Hinds Howell** emphasised the frequency with which subdural hæmorrhages were bilateral, and cited an instance in a man aged 60. Following what at first appeared to be a mild head injury, left hemiplegia developed after six weeks. Operation was performed on the right side, and a large subdural hæmatoma was found and evacuated. The patient improved for 24 hours, after which he relapsed into a semi-comatose condition. The operation area was re-explored, as it was thought that further hæmorrhage might have occurred. Nothing was found, and it was hoped that the compressed brain still remained unexpanded. The patient died on the following day, and autopsy showed another subdural hæmatoma on the opposite side. The speaker had seen cases of subarachnoid hæmorrhage with massive albuminuria similar to those described by Prof. Hall, and there was an obvious danger of making a preliminary diagnosis of uræmia. In association with the albuminuria, glycosuria and acetonuria might also occur.

PLASMOQUINE IN MALARIA.

A REVIEW OF RECENT EXPERIENCES.

Plasmoquine, the trade name for N-diethylamino-isopentyl-8-amino-6-methoxy-quinoline, was introduced into the therapeutics of human malaria in 1926, and for five years workers in various parts of the world have been testing its uses and limitations.

The Army in India.

There is no organised body of men whose efficiency has been more handicapped by malaria than the British Army serving in India. Accurate statistics of the morbidity from this cause have been kept over a long period, so that it has become possible to estimate the value of any form of antimalarial treatment with greater degree of accuracy amongst soldiers under continuous and disciplined observation than amongst a similar body of civilians. An exhaustive trial in India of plasmoquine and quinine has recently been reported [1] by Major J. A. Manifold in the treatment of benign tertian malaria, the form of malaria most prevalent amongst serving units and most detrimental to service. In this paper Major Manifold has drawn on the accumulated experience of 325 publications on this subject which have appeared lately. From a study of these it has been realised that many of the untoward symptoms hitherto described were due to the slender margin between the therapeutic and toxic doses of plasmoquine. Sinton, Smith, and Pottinger *having in 1930* reported unfavourably on a daily dose of 0·06 g., it was resolved *to try 0·04 g. plasmoquine plus* 1·25 g. (grs. 20) of quinine taken for 21 consecutive days. The troops concerned in mass treatment included both British and Indians, the latter varying greatly in physique. *The experiment being spread* over such a huge area of country with varying degrees of humidity and temperature, the conditions varied enormously. *In most* stations it was quite impossible during the malaria season to discriminate between fresh cases of malaria and relapses. Any attempt to take into account different factors by varying the dosage of plasmoquine was obviously impracticable; no difference was made in the dosage used for individual cases and any fresh attack within six months of completion of treatment was considered as a relapse. By entrusting the treatment however to a large number of medical officers in different parts of India many individual results and opinions could be obtained. Sufficient plasmoquine was available to treat 4000 cases, and in each command certain officers were selected to undertake the treatment and to keep records of the cases treated. In stations in which a laboratory was situated the medical officer carrying out the treatment worked in close coöperation with the officer in charge of the laboratory.

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[1] Jour. R.A.M.C., May–June, 1931.

The treatment of all cases of benign tertian malaria consisted of one tablet containing 0·02 g. plasmoquine combined with grs. 10 of quinine in the morning and a similar amount in the evening, the total course of treatment being 21 days. In all, 3187 cases (1286 British, 1901 Indian) of benign tertian malaria completed this course and are included in the analysis. Cases treated after Dec. 31st, 1929, and subtertian cases treated partially with quinine and subsequently with plasmoquine were not included. A special watch was maintained for toxic symptoms and precise instructions having been issued regarding their nature. In the great majority of instances these symptoms were never severe and frequently were not mentioned in the hospital register after the first 20–30 cases had been treated. The effects of suggestion, particularly as regards "colic," could not be neglected for it was noticed that once patient and medical officers had gained confidence in the drug, complaints became fewer and eventually ceased altogether. As a corollary to this the larger the number of cases treated in a hospital, the more favourable the opinions expressed on the value of the treatment and the fewer were the toxic symptoms of real importance noted—a statement which tallies with the experience of other workers both here and in the tropics.

TOXIC SYMPTOMS.

The percentage of toxic symptoms recorded, such as abdominal pain, cyanosis, and digestive disturbance was less amongst Indian than amongst British patients, owing no doubt to the greater attention paid to mild symptoms. In view of the fact that 99 per cent. of all the cases ultimately completed their course of treatment, toxic symptoms cannot have been severe. Abdominal pain constituted the one constant complaint; it was found to occur with less frequency when the drug was taken on a full stomach or with a large draught of water. The incidence of this pain definitely increased with the duration of the treatment indicating, as had already been realised, that plasmoquine is a cumulative drug showing its maximum effects on about the sixth day of treatment. Epigastric pain occurred as a rule within a few days of beginning the course and disappeared quickly on temporary cessation of plasmoquine administration. In this series of cases cyanosis is recorded as having been noted in 4·3 per cent. of British and 0·67 per cent. of Indians. The lower proportion amongst the latter group is probably accounted for by the difficulty of recognising it in dark-skinned races. As previously noted by Fischer and Weise the cyanosis becomes evident clinically about the seventh day and it appears also to occur with greater frequency in anæmic cases and is accompanied usually by epigastric pain. Many cases appeared to lose their pink complexion during treatment, but yet could not be called actually cyanosed. It seems then that in a small percentage of cases there does exist a definite individual idiosyncrasy to the action of the drug with reference to epigastric pain and cyanosis. In the average case of cyanosis a continuance of the treatment does no harm and the methæmoglobinæmia does not increase.

Opinions were much divided as to the effect of the treatment in the reduction of chronic enlargement of the spleen; only in acute enlargements is it effective in reducing the organ to normal size. As regards the pyrexia it was found that on the whole patients responded more rapidly to treatment with plasmoquine and quinine than to quinine alone, and in no case was it necessary to give intravenous or intramuscular quinine. Relapse is the crux of efficient treatment and out of this trial the test has emerged triumphant. The relapse-rate was surprisingly small, the average for all classes and stations being 5·2 per cent. If cases relapsing after what may be roughly called the end of the malaria season in the various stations only were accepted as relapses, then the relapse-rate would be as low as 2·4 per cent. The figures for the relapse-rate are definitely favourable as compared with the usual quinine treatment. In the quinine-treated control series of Sinton, Smith, and Pottinger at Kasauli the relapse-rate was as high as 42 per cent.

There were two deaths amongst the Indian cases. The first occurred after vomiting and was not considered to be due to plasmoquine treatment; the second appears to have been due to blackwater fever (methæmoglobinæmia) and it is possible that it was a case of mixed injection with benign and subtertian malaria. There were two other cases of mild methæmoglobinæmia which recovered; they may have been mild cases of blackwater fever more likely than instances of toxic plasmoquine methæmoglobinæmia.

The report closes with quotations from various medical officers in the I.M.S. and R.A.M.C. On the whole the opinions were favourable and encouraging. The efficacy of this treatment combined with simplicity of administration and shortness of course appealed to both medical officers and troops. Most questions on this important subject having been satisfactorily answered it remains to be ascertained whether plasmoquine can be safely issued to patients not under medical supervision. The answer would appear to be definitely in the negative, but if the margin of safety can be made greater and good results obtained by utilising 0·03 g. plasmoquine as a daily dose plus quinine (grs. 20) for 21 days, a definite advance would be made. Investigations on these lines are being carried out at the malaria treatment centre, Kasauli. There 57 cases have been treated up to date. Toxic symptoms have been non-existent and the patients have been able to play an occasional game of hockey or football.

Central America.

Three other reports of importance are before us. The staff of the United Fruit Company have been assiduous in recent years in investigating plasmoquine treatment. In the nineteenth annual report of the company's medical department, Dr. N. P. Macphail writes on plasmoquine as an aid in malaria prevention in Guatemala. The conclusions arrived at as the result of the administration of 1,388,000 tablets of plasmoquine were as follows: Plasmoquine effectively destroys the gametocytes of all forms of malaria when given in doses of 0·03–0·04 g. daily for one week. Combined with quinine, plasmoquine is a safe and sure way of preventing the formation of gametocytes during an attack of malaria; and the combination destroys all types of parasites. Toxic symptoms need not be feared when the dosage is limited to 0·03 g. daily for a week or more. It is considered that there is ample clinical proof to justify the hypothesis that plasmoquine is of importance as a curative factor in chronic cases which have resisted extended efforts at eradication with quinine and arsenical preparations.

Dr. Vincente Bustillo, at Banes, Cuba, has come to much the same conclusions. The doses of plasmoquine in his practice are much smaller and consist of one plasmoquine tablet (0·01 g.) for four days and grs. 20 of quinine. Children under 5 years of age received 0·005 g. for eight days and no untoward effects with the dosage above mentioned have been noted. Since 31 out of 34 cases showing crescents in the blood became negative within nine days subsequent to the initiation of plasmoquine treatment, it can be concluded that the doses used were sufficient to cause a disappearance of gametocytes from the peripheral circulation from one to eight days in 91 per cent. of the cases and within nine to twelve days in the remaining 9 per cent. The easy disappearance of gametocytes leads to the belief that plasmoquine has a direct action upon them; but it is probable that they are devitalised to be afterwards destroyed by phagocytoses.

In assessing the rôle of plasmoquine in the sanitation of Panama, O. T. Brosius exercises due care in the field of its application. Working with a force of employees totalling some 4800 the difficulty of gauging the value of "blanket treatment" with plasmoquine and quinine may be imagined. The conclusions arrived at are that plasmoquine has probably played a more active rôle in effecting a reduction in malaria infections than was given credit for in earlier attempts to determine its exact value in tropical sanitation. It is emphasised that with a distinct reduction in malaria, there was a simultaneous decrease in the hospital admissions, which was more or less in direct ratio to the malaria decline. In a community such as Panama with a comparatively limited turnover in the labour force by sufficiently frequent plasmoquine and quinine blanket treatments the sterilisation of the gametocytes to malaria carriers can be repeated at given intervals.

The Present Position.

It is evident from the information summarised above and the publication[2] of the prophylactic experiments of S. P. James and his co-workers that the whole question of plasmoquine has entered a new phase. The progress so far achieved has been satisfactory, but a less poisonous compound than plasmoquine would undoubtedly lead to greater confidence in its extended usage away from medical supervision, and it is much to be hoped that in the future less toxic compounds will be found. More information is needed about the effect of administering plasmoquine under all sorts of conditions. Recent work has confirmed in a striking manner the accuracy of the pioneer observations made with a limited series of cases at the Tropical School in Hamburg, and subsequently at the Hospital for Tropical Diseases, London.

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[2] THE LANCET, August 15th, p. 341.

REVIEWS AND NOTICES OF BOOKS

Heart Disease.

By PAUL DUDLEY WHITE, M.D., Instructor in Medicine, Harvard Medical School; Physician, Massachusetts General Hospital, Boston. London: Macmillan and Co., Ltd. 1931. Pp. 931. 42s.

Dr. Paul White's book is the most comprehensive treatise on cardiology which has appeared in the English language in recent years. It touches on every aspect of the subject, from the most important to the most trivial, and therein lies its chief defect—namely, a lack of perspective. There is too much detail, too little emphasis on some of the main points. To deal adequately with all the subjects to which the author refers would require a book of at least twice this size, and it is doubtful whether any one cardiologist would be competent to write such a book. Possibly this criticism will be less pertinent for the American than the English reader, for there is a wide difference in the outlook on medicine in the two countries. In America the investigation of clinical cases follows a more universal plan than in Britain; every fact is carefully recorded in the case-notes, with the result that sometimes it appears to us difficult to sort out the capital matter. With us the investigation of cases is less systematic. Our idea of a great clinician is a man who can pick out the essential points of a case and give his undivided attention to them alone, discarding everything which is irrelevant. The great teachers of medicine in this country have impressed on the minds of their students vivid pictures of individual cases in the wards. This difference of viewpoint is strikingly illustrated by Dr. White's book. He refers occasionally, it is true, to the occurrence of particular symptoms in patients in his own practice, but from beginning to end his treatment of the subject is strictly systematic.

The book is divided into four parts, which deal respectively with the methods of investigation including symptoms and physical signs, the ætiological types of heart disease, structural lesions, and lastly, disorders of function. Part I. includes an excellent account of cardiovascular radiology, an aspect of diagnosis which has hitherto been scantily treated in most English text-books. In other parts of this section the author is apt to over-classify. The statement that such and such a condition may be due to 1, 2, 3, or 4 is a joy to students, but is too watertight for the more advanced reader. In the chapter dealing with sphygmomanometry (p. 127) the author refers to the disappearance of the Korotkow sounds as the diastolic end-point. With this neither physiologists nor clinicians will agree.

Part II. opens with some extremely interesting graphs comparing deaths from heart disease in the United States with those from cancer and tuberculosis, and the age-incidence in fatal cases. But influenza and focal infections, which we regard as important causes of cardiac invalidism, are allotted only half a page each, while gout is dismissed in two lines. Sense of proportion is similarly lacking in the reference to Raynaud's disease and chilblain (Part IV.), and to angina pectoris, to the consideration of which the author devotes only 20 pages. Part III. deals with structural lesions. This inevitably leads to difficulties. Why for example refer at all to "the course, prognosis, and treatment of cardiac enlargement" (p. 468) which obviously varies with the cause of the lesion? And why consider under the heading of aortic valve disease two such entirely dissimilar conditions as syphilitic aortitis and rheumatic endocarditis, or why group together syphilis and atheroma of the aorta? Maybe Dr. White has adhered to an older classification, feeling that in recent years the pendulum has swung too far and morbid anatomy is being neglected at the expense of disorders of function. With this attitude most cardiologists will heartily agree, but the remedy does not lie in merely reverting to the faults of the older classification.

In his general outlook in cardiology Dr. White favours the middle course, as may be seen from his frequent use of the phrase "the truth probably lies between these two extremes," but from time to time he is lured back to the camp of the anatomical diehards. This may be the reason why in enumerating the causes of congestive heart failure (p. 565) he gives first place to valvular defects and includes auricular fibrillation as one of the less common causes of the condition. In England it would be no easy matter to collect a hundred cases of congestive heart failure with normal rhythm. The section dealing with the treatment of congestive heart failure, and especially digitalis therapy, is excellent and full of common sense though exception might be taken to the statement (p. 567) that cardiac dyspnœa is due primarily to oxygen lack.

The book is well got up. The illustrations, many of which are taken from the works of Sir Thomas Lewis, are clear and well produced. An attractive feature is the detailed quotations from the writings of pioneers in cardiology. In his preface the author states that the bibliographic index is intended to be as brief as is consistent with its usefulness. Nevertheless it occupies nearly 200 pages, and gives some indication of the amount of work the author must have put into his book. British cardiologists will find in Dr. White's book a good systematic account of heart disease based on views accepted in great American schools.

Recent Advances in Radiology.

By PETER KERLEY, M.B., B.Ch. (N.U.I.). D.M.R.E. (Camb.), Assistant Radiologist, Westminster Hospital; Radiologist, the Royal Hospital for Diseases of the Chest. London: J. and A. Churchill. 1931. Pp. 324. 12*s.* 6*d.*

THIS volume of the Recent Advances series is written in a clear and convincing style and Dr. Kerley deserves congratulation for having steered his way so skilfully through many of those stretches of radiology that are still uncharted. Sometimes, however, he errs on the side of a dogmatism that is not justified. His insistence on the basic pathology is commendable in a book which is, as it should be, clinical in character.

The general outline and construction of the work are satisfactory, and it is well indexed. On the whole it may be taken as a sound guide, though in certain details the teaching would not be generally accepted. Many hypotheses are set down as facts, as, for example, the statement that "the arch of the aorta is always dilated if aneurism is present in another part of it," or that "we now know Perthes' disease, Kienböck's disease, Köhler's disease and Schlatter's disease to be manifestations of the same disease." The author's gift for clear exposition has led him to make pictures appear more definite and sharply defined than the facts justify, especially in connexion with differential diagnosis. The novice reading this book would see little difficulty in making a definite diagnosis in cases where experience would advise great caution, with efforts to obtain confirmation from every possible source before an opinion is expressed.

Discounting this tendency, which is manifest throughout the book, the volume provides a good résumé of present-day knowledge, especially as regards the German point of view. The names of German workers are freely given to various signs and methods. For instance, the absence of evidence of a gastric peristaltic wave as it passes over an affected area of diseased wall is here called Fraenkel's sign, the reference given being 1927. This phenomenon was noted many years ago in some of the earliest papers on the subject, and there seems little need to associate it with any observer's name. The short chapter on radiotherapy sacrifices accuracy to brevity, and would have been better omitted. The book is well and clearly written and is likely to achieve success. It will be of great value to radiologists, particularly those of experience who can discount the author's enthusiasm and appreciate the vast amount of work that has been embodied in this book.

The illustrative radiograms and line drawings are very clear. Many of the former are touched up to emphasise the points, and although the immediate purpose is served, the novice may carry away a false impression of the appearances he is likely to discover in his own films in similar conditions.

Piersol's Human Anatomy.

Ninth edition. Under supervision of G. CARL HUBER, M.D., Sc.D., Professor of Anatomy and Dean of Graduate School, University of Michigan. London: J. B. Lippincott Company. Pp. 2104. 45*s.*

WE welcome this new edition of a well-known book, which has long passed beyond the region of general criticism. In this issue the new matter has to do mainly with histological questions, such as the origin of blood-cells and like matters, and the B.N.A. has been introduced throughout. Care has been taken to preserve the pagination of the last edition, so that guides and references can remain unchanged. Several new illustrations have been introduced, and the work in general has been brought up to date.

Rest and Pain.

By JOHN HILTON, F.R.S. Edited by W. H. A. JACOBSON. London: G. Bell and Sons. 1931. Pp. 514. 5*s.*

Hilton's famous lectures on the influence of mechanical and physiological rest in the treatment of surgical diseases were published some 70 years ago, after their delivery before the Royal College of Surgeons of England. In these the insistence on the diagnostic value of pain is associated with elaborate knowledge of surgical anatomy, and the popularity which the work obtained is not surprising. During Hilton's life the book was several times revised, but after his death his editor left the text untouched, and between 1880 and to-day 14 editions have been published. Though modern knowledge has made much of the book out of date, its general messages and its philosophy remain just. It is one of the works that promise to earn and keep the over-used epithet of "classic."

THE LANCET.

LONDON: SATURDAY, SEPTEMBER 5, 1931.

THE COMMON COLD.

The medical profession is much abused because it cannot cope with the common cold. Here, people say, is a world-wide disease which is always with us and is responsible for an enormous amount of discomfort and loss of human efficiency; yet nothing is known about its causation, and its treatment is empirical and unsatisfactory. To anyone acquainted with the facts such a criticism is of course manifestly unjust. The problem of ætiology is far from being a simple one; the very fact that it has remained unsolved so long is proof enough of that. None of the ordinary laboratory animals is suited for its investigation and the disease is so widespread in man as to make him of little value as an experimental animal unless he is subjected to most rigorous quarantine and irksome isolation.

For some time now the idea has been current among bacteriologists that the primary cause of the common cold is not one of the ordinary bacteria, but a member of the group of filter-passing viruses. Support to this view was lent by the findings of W. Kruse (1914), G. B. Foster (1916), and H. Dold (1917); but doubts have now been settled beyond all dispute by the masterly investigation which Prof. A. R. Dochez and his colleagues describe elsewhere in this issue. Their work soon led them to the conclusion that the visible bacteria present in the nasopharyngeal discharge were only of secondary importance, so they turned their attention to the filter-passing viruses. And since observation had shown that the chimpanzee was subject to a respiratory infection resembling in every way the human cold, they used this animal for their experimental work. The results of these experiments on apes left no doubt that the cold virus was a filter-passer. Typical colds were produced in chimpanzees by means of the filtered nasopharyngeal washings from human cases, passages in series from ape to ape were realised, and infection by contact was shown to take place. Needless to say the most stringent precautions were taken to exclude infection from outside sources. Dochez and his colleagues then proceeded to carry out the same experiments with human volunteers. Here again the greatest care was taken to ensure that their subjects were not infected before being taken on experiment and that all outside sources of infection were excluded. The human experiments were just as conclusive as those made with the chimpanzee. But this is not all. Using a culture medium consisting of a special buffered broth containing chick embryo tissue and brought to a suitable reduction potential by means of cystein hydrochloride, these workers have been able to cultivate the virus of the common cold. And with the fifteenth subculture, representing a dilution of 1 in 1,000,000,000,000,000, they have produced typical colds in two out of three human volunteers.

Not less interesting are the speculations of Dochez and his collaborators on the part played by this virus in respiratory infections in general. Their experimental work has shown them that this virus renders the respiratory tract more susceptible to the implantation of pathogenic organisms, as well as enhancing the activity of any potential pathogens which may be present there. Observations in America have shown that the common cold has three peaks of incidence, one in September and October, another in January and February, and a third in April and May. Further, the cases occurring in winter and spring are usually more severe than those arising in the autumn. Coincident with this increased virulence of colds as the winter lengthens into spring there is an increasingly wide distribution of such organisms as the pneumococcus, the influenza bacillus, and *Streptococcus hæmolyticus* in the nasopharynx of healthy individuals. Thus as the winter advances the opportunity enlarges for these potential pathogenic organisms to cause infection, with the result that their distribution becomes more widespread and their virulence is probably enhanced. It is at this period of the year that pneumonias and bronchial infections are most common, and it may well be that Dochez's virus is in part responsible for this. Be this as it may, the principal thing for the moment is that the ætiology of the common cold has at last been cleared up. Complete confirmation of these findings is forthcoming from an investigation carried out by P. H. Long and a team of collaborators[1] on human volunteers at the Johns Hopkins University and an important field is opened up for further work. All who have followed these researches of Dochez and his associates must have been struck not only by their thoroughness, but also by their undeviating march towards success. It is a brilliant piece of work.

THE BASEMENT CHILD.

From the Bishop of Southwark we have in a small volume[2] some penetrating observations upon the social conditions of one district of his industrial diocese. He records the circumstances of living which are compulsory upon the inhabitants of the southern shore of the Thames from Battersea to Woolwich, an area that is densely inhabited by a wage-earning class—where, that is, employment is obtaining a return in wages. Dr. Garbett gives a vivid picture, based upon knowledge and checked by experience, of an urban area, where men, women, and children are condemned to make such homes as they can amid the evils of overcrowding—an area where the safeguards of sanitary supervision and the benefits of social service, both well displayed, cannot keep the menaces of ill-nutrition at bay. And the reason is the abominable housing, where basements are always damp and living rooms often so overshadowed by high walls that direct light cannot penetrate them.

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[1] Jour. Exper. Med., 1931, liii., 447.

[2] In the Heart of South London. By the Right Rev. Cyril Forster Garbett, Bishop of Southwark. London: Longmans Green and Co. 1931. Pp 152. 3s. 6d.

The text of the book was expounded by his lordship recently in the Upper House, when in an eloquent speech[3] he drew attention to the large number of persons now living in underground buildings, not only in South London, or London generally, but in all our big cities. He inquired if the local authorities were playing their part in the construction of new houses to meet the evils of overcrowding, and brought forward a motion for the institution of a central housing council, which, he considered, would stimulate the erection of suitable habitations for the working classes. This motion he withdrew later, on an explanation from Lord SNELL, speaking for the Government, that the powers possessed by the local authorities were already adequate, and the provisions of the Slum Clearance Act of last year were quoted in support of his words. And although Lord SNELL deprecated concentration upon a particular aspect of the evils which had to be dealt with, the Bishop of SOUTHWARK's indictment of basement dwellings made a valuable impression upon the House. And now Dr. GARBETT's words receive powerful endorsement in the report for 1930 of the school medical officer of the London County Council, which appeared this week, for, in a section of his general annual report,[4] Dr. KAY MENZIES includes the results of a special inquiry made by Dr. A. BANKS RAFFLE into the condition of children living in basements, the information being compiled by the inspectors of the Council, and derived from elaborate inquiry among families occupying basements in eight metropolitan boroughs, widely separated in geography, and differing in rateable values.

The boroughs selected were Kensington, Paddington, Westminster, Islington, Finsbury, Poplar, Stepney, and Southwark. The children were examined in their schools, and the findings were checked by double control, each basement child being compared with two non-basement children of the same sex and age, and, as far as possible, in similar social circumstances. In this way 254 basement children were examined and 508 controls, and the examiner was throughout in ignorance which of the little subjects were basement dwellers. The inspection cards revealed that the incidence of pneumonia and bronchitis was not markedly different in the two classes, but there was a definitely higher incidence of diphtheria among the basement children and a greater tendency to rheumatism. The physical examinations were directed especially to debility, defective sight, rheumatism, and rickets. At most ages, and particularly among the older children, the basement children compared unfavourably with the controls in weight and measurement; they were as clean and no more anæmic, but they were not as well-nourished. While defective vision was present in similar proportion—about 24 per cent.—symptoms of rheumatism were nearly three times as frequent among the basement children, and throat and nose affections were found in 7·4 per cent. of the basement children and in only 3·3 per cent. of the controls. Rather unexpectedly rickets was evenly distributed, at just above 7 per cent., between the two classes. At first sight the contrasts revealed do not seem to justify the universal indictment of the basement as a home for children, but Dr. RAFFLE points out wisely that the figures do not tell the whole story. He supports the Bishop of SOUTHWARK's words by saying that in some areas, giving Southwark as the example, it was possible to pick out, on sight, some of the basement children from their controls, while inquiry into educational standards showed that children living in basements do not, as a class, progress at school satisfactorily—the head teachers returning as definitely backward 24·8 per cent. of the controls and 43·6 of the basement children, who; moreover, were double as irregular in attendance. This inquiry may not reveal the lurid conditions expected in some quarters, but it shows enough to give cause for thought to the public authorities concerned. It is the ambition of the financier to get in on the ground floor, but it should not be that of the tenement dweller, whatever the pecuniary inducement.

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[3] THE LANCET, July 18th, 1931, p. 163.

[4] Annual Report of the London County Council, 1930, vol. iii., Part II.

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PINK DISEASE.

THE disorder of childhood to which this name among many others has been ascribed has definite and striking clinical characteristics,[1] but an ætiology and pathology which have not yet been clearly established. For many years it has both fascinated and perplexed pædiatricians, and lately the interest has not been limited to medical circles. The development of our knowledge of the disease, its discovery by independent observers in different countries, and the various titles it has received, furnish material for an interesting study. It is difficult to say whether or not it is a new disease, but the fully developed clinical picture is so characteristic that it seems impossible that it should have passed unrecognised for long, and in this country it is generally conceded that it is a "symptom complex" which was not met with before the late war. Certainly there is no published reference to it before February, 1914, when H. Swift, of Adelaide, reported to the tenth Australasian Medical Congress at Auckland, 14 cases of what he thought was a new disease, and called "erythrœdema." Although this paper constitutes the first printed account, the condition was noticed in Australia many years before, for A. J. Wood,[2] in 1921, reporting a series of 91 cases, remarked that he had seen examples of the disease at Melbourne for 30 years previously, and that even before that time W. Snowball of the same city had recognised it and spoken of it as "raw beef hands and feet." C. B. Clubbe had also observed the disease in Sydney for several years before this date, and is responsible for calling it "the pink disease," a name which possesses advantages over many of its synonyms in that it accurately describes the chief symptom, is not misleading, and does not commit the user to any particular view of its pathology. The condition also seems to have been recognised in Germany and France some years before it was recorded, for in a paper published by P. Selter[3] in 1926–27 he states that in 1903 he reported eight cases under the title of "trophodermatoneurose" or "vegetative neurosis" to a medical society at Cassel, in Germany; and P. Haushalter,[4] of France, writing in 1925 on a "neurovegetative syndrome in infants," remarked that he had been familiar with the syndrome since 1911.

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[1] THE LANCET, 1921, i., 871.

[2] Med. Jour. Austral., 1921, i., 145, see THE LANCET, loc. cit.

In the United States of America the disease seems first to have made its appearance about 1915, and in Canada in 1918, although its identity with the pink disease of Australian writers was not recognised until some years later. In 1917 A. H. Byfield, in a paper read by title before the American Medical Association, described the earliest cases as "trophoneuroses probably due to an infection," and again in 1920 as "a polyneuritic syndrome resembling pellagra-acrodynia (?) seen in very young children."[5] A little earlier in the latter year J. B. Bilderback had recorded some instances of an unknown disease which he had met with in his practice; later W. Weston[6] came to the conclusion that these were examples of a disease which assumed epidemic proportions in Paris in 1828–29, and to which the name of acrodynia was given by Chardin. In 1923 it was quite clearly pointed out by J. Zahorsky that all these American cases were identical with pink disease. Although Weston and many other American authorities still regard pink disease as a juvenile form of acrodynia, it is highly improbable that the two diseases are identical, one reason being that acrodynia was an epidemic disorder attacking adults, whereas pink disease is a sporadic disease of infancy and early childhood; further, Petren has produced good evidence to show that acrodynia was due to the drinking of wine contaminated with arsenic. In England the first case of pink disease was described in 1921 by Parkes Weber, who demonstrated it before the Dermatological Section of the Royal Society of Medicine as "a condition somewhat resembling lupus pernio in a child"; in 1922 H. Thursfield and D. H. Paterson[7] published a report of a case under the heading of "dermatopolyneuritis"; and in 1923 L. G. Parsons[8] reported six cases, two of them observed in 1920. E. Feer,[9] of Zürich, was the first continental writer on this disease, and in 1923 he redescribed the condition as a "neurosis of the vegetative nervous system," pointing out that many of the characteristic symptoms were referable to a disturbance of the sympathetic nervous system—e.g., extreme irritability, sweating, cold and clammy extremities, tachycardia, raised blood pressure, salivation, hypotonia, photophobia. This communication created such an impression that on the continent the disorder is usually referred to as "Feer's disease."

An annotation in our issue of May 2nd summarised some of the latest necropsy findings, and W. G. Wyllie and R. O. Stern[10] have just published an important paper recording the pathological findings of seven further cases. Degenerative changes were found in the peripheral nerves of four of them; chromatolysis of the central type, more apparent in the lumbo-sacral cord than elsewhere, was present in the anterior horn cells in five; and in all cases the spinal cord showed that diffuse infiltration with small cells which was first described by J. G. Greenfield and Paterson. These results, they state, confirm those already recorded and afford further evidence that lesions in the nervous system are to be found in a large proportion of cases. Taking all the published morbid findings into consideration it must be admitted that as yet no single lesion has been established as a constant characteristic of the disease, and it is a point of some significance that the clinical symptoms have always been considerably in excess of the pathological findings. It is therefore not surprising that the ætiology of pink disease has given rise to much discussion. Three theories of its causation have been propounded: First that it is a deficiency disorder; secondly that it is the result of an infection; and thirdly that it is a dysfunction of the vegetative nervous system. The resemblance to pellagra, which was commented upon by the earlier American writers, is a point in favour of the deficiency theory, and some transatlantic authorities still believe that the two diseases are related. There are, however, essential differences between them, perhaps the most obvious being the absence in pink disease of the seasonal variations of the rash which are so characteristic a feature of pellagra. Again, a deficiency in any of the known vitamins has never been demonstrated in the diets of sufferers from pink disease. On the other hand, Marshall Findlay and R. O. Stern[11] found that young rats developed a clinical condition which resembled pink disease, and pathological changes in the peripheral nerves, and a cellular infiltration of the cord similar to that described in autopsies on pink diseases, when they were fed on a diet which contained all the known vitamins but in which the sole source of protein was egg white. Moreover, this condition was cured by the addition of dried yeast or raw liver to the diet, which suggested that it was due to a deficiency in some dietetic factor but not one of the known vitamins. Applying these findings to children suffering from pink disease, Wyllie and Stern report the recovery of five patients fed on a liver diet, and they consider that there is a dietetic factor contained in liver which has a definite curative value.

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[3] Arch. f. Kinderh., 1926–7, lxxx., 241.
[4] Rev. Neurol., 1925, i., 401.
[5] Amer. Jour. Dis. Child., 1920, xx., 347.
[6] Arch. Pediat., 1920, xvii., 513.
[7] Brit. Jour. Child. Dis., 1922, xix., 27.
[8] THE LANCET, 1923, i., 490.
[9] Ergeb. d. inn. Med. u. Kinderh., 1923, xxiv., 100.
[10] Arch. Dis. Child., 1931, vi., 137.
[11] Ibid., 1929, vi., 1.

The not infrequent occurrence of prodromal catarrhal symptoms in connexion with the nose and throat; the increased incidence shortly after the last great pandemic of influenza; and the appearance of acrodynia in 1828, exactly one year after the first influenza pandemic of the nineteenth century, have all been stressed as points in favour of the infective theory. M. Péhu and A. Mestrallet believe that the condition is the result of a specific infection of the nervous system, closely analogous to encephalitis, and both H. Janet and R. J. Turquety maintain that it is due to a neurotrophic virus which gains access to the nervous system through the naso-pharynx. The pathological evidence in favour of the infective theory is, however, but slight. Finally Feer's suggestion that the condition is a functional disorder of the vegetative nervous system rests on the clinical evidence of such a disturbance, and the fact that in one fatal case he could not find any alteration in the sympathetic system after a very careful examination. However true it may be that such a disorder of function is the cause of the symptoms, this theory does not provide any explanation of the functional disturbance itself. What evidence there is as to the cause of pink disease appears to favour a dietetic deficiency as *an* ætiological factor, although possibly not *the* factor. Indeed it may well be that, as first suggested by Byfield, the disease, or the dysfunction of the vegetative nervous system which produces it, is due to a combination of the first two causes—in other words, that a dietetic deficiency may produce a state which favours an infection.

ANNOTATIONS

FOOD-POISONING IN CALIFORNIA.

At one time California had an unenviable notoriety for outbreaks of botulism, but vigorous action has reduced these to small proportions. The three examples of food-poisoning now reported from this State by Prof. A. J. Geiger and co-workers[1] were due to salmonella organisms. In the first, at Sacramento in January, 35 persons were visited with diarrhœa, vomiting, and the usual acute symptoms. The incubation period was very short, being two and a half to four hours, but there were no deaths. The sufferers belonged to a party of 60 who attended a late evening banquet. While a considerable number of foods were eaten, inquiry showed fairly definitely that the main meat course of chicken and chopped-up veal, with cream sauce, was at fault. From this *Bacillus enteritidis* was isolated, but with great difficulty, partly, it seems, because the bacilli were very scanty and partly because the mixture was heavily contaminated. The premises were rat-infested, and the authors consider that rats were the probable source of the infection. The mixture was given ample time to be infected, for the chickens were cooked and boned on Jan. 18th, left about overnight, and mixed with the veal on the 19th, and the mixture with cream sauce was warmed up on the 20th to be served at the late supper. Another outbreak was at a hospital, and 200 people were afflicted with somewhat similar symptoms to those of the Sacramento outbreak. The incubation period was also short, two to four hours, and again there were no deaths. While the food involved seems definitely to have been rice pudding covered with a fruit sauce—since this was the only food eaten in common—the evidence does not clearly show the course of infection. A *B. aertrycke* strain was isolated from the rice pudding, and was not found in the original rice. Only one stool of a sufferer was examined, and that revealed nothing, while no agglutination blood tests were carried out. There is no actual proof therefore that the patients suffered from a living infection with this organism. The pudding was heated in a steam cooker for about an hour, and then kept for six to eight hours before being served. Possibly infection took place subsequently, but apart from an unconfirmed suspicion that a commercial rat-killer had been employed, no source of infection was found. No information is given about the source of the milk used.

The third outbreak, which was in March, was also in a hospital, and caused the illness of 52 persons. Here, too, there was a short incubation period (three to four hours), the symptoms being nausea, vomiting, diarrhœa, and great prostration. The peccant food was an egg soufflé shrimp mixture, served with tinned peas; it was harmless when first eaten, but after remaining overnight in the kitchen it became definitely poisonous on being warmed. *B. paratyphosus* A was isolated from a stool from the assistant cook, and the outbreak is ascribed to this organism; but there is insufficient warrant for this. Three excreta samples were negative, and in the single fatal case the internal organs disclosed no food-poisoning bacilli such as are to be expected almost invariably when death is due to a living salmonella strain. No blood agglutination tests are recorded, and none of the food mixture eaten was available for bacteriological examination.

Apart, however, from obscurities about the exact bacterial strain responsible, and whether the illnesses were due to living bacilli or to their toxins only, the three outbreaks illustrate the fact that food-poisoning is usually due to manipulation of food, which gives opportunities of infection, and that the greatest danger comes from meat or milk foods which are heated and then left about to get cool. The greatest attention must be paid to the storage of foods which have been heated and are allowed to cool slowly, and this especially applies to those which are good culture media for the food-poisoning bacilli. Such attention, together with scrupulous cleanliness, will prevent a considerable proportion of outbreaks; and perhaps the lesson is being slowly learnt. In Great Britain food-poisoning has been relatively commoner than in the United States, but of late it has seemed to be diminishing.

BLOOD TRANSFUSION IN STREPTOCOCCAL SEPTICÆMIA.

The treatment of streptococcal septicæmia by immuno-transfusion, as advocated by Almroth Wright in 1918, is the subject of a study by Prof. P. Abrami and Dr. A. Tzanck in *Paris Médical* for August 1st. After discarding some 29 cases, because sufficient data were not available, they confine their observations to

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[1] Public Health Reports, Washington, July 3rd, 1931, No. 27, xlvi., 1565–72.

43 cases of streptococcal septicæmia in which a hæmolytic streptococcus was either actually found in the blood (22 cases) or the case was recognised as such on circumstantial evidence. Those in which it could not be found in the blood were not as a class any more benign than the blood-positive cases, among which there were 12 recoveries. Among the blood-negative cases there were nine recoveries. The donors were sought as far as possible among women who had recovered from puerperal fever, and had been inoculated according to the technique described by Jaubert in 1928. Further, whenever it was possible, the donor was reinoculated with autogenous vaccines, made from the patients themselves within six hours of the transfusion. The cases recorded in some detail emphasise the point, made by the authors early in their paper, that the measures adopted in each case were as varied as were the processes which led to recovery in such a goodly proportion of their cases. It follows that their study is not of the kind that lends itself to summary review.

INTRACRANIAL TUMOURS.

THE last 20 years have seen considerable advances in our knowledge of intracranial tumours from their clinical, pathological, and therapeutic aspects. The time is therefore ripe for a critical review of this subject and Dr. F. M. R. Walshe's paper [1] is a valuable survey of this wide and ever-widening field of medicine. It was impossible within the limits imposed to deal with the whole of our present knowledge of intracranial tumours, and Dr. Walshe has necessarily confined himself to what may be termed the growing points of the subject. The clinical and therapeutic importance of the pathology of tumours of the brain was hardly recognised at all until comparatively recently. Chiefly owing to the researches of Cushing and his pupils it has been learned that the different types of tumours, even the different types of glioma, often exhibit a characteristic age-incidence and rate of growth and a predilection for certain situations in the brain. Hence it is becoming possible for the clinician with increasing frequency to diagnose not only the presence and situation of an intracranial tumour, but also its precise pathological nature, which proves of importance in forming an accurate estimate of its prospect of removal, of the peculiar difficulties likely to be encountered in the task, and of its probable malignancy. The importance of pathology is reflected in the fact that Dr. Walshe devotes more than a third of his paper to the classification of intracranial tumours. He gives an admirable account of the development of the modern conception of the gliomas as tumours corresponding in structure to different stages of development of embryonic neural tissue, and though he does not commit himself to the finality of any existing classification, he fully recognises the importance of current theories.

Dr. Walshe analyses the pathological physiology of raised intracranial pressure and rightly lays stress upon the importance of generalised epileptiform fits as an initial symptom of tumour. Except among neurologists it is inadequately recognised that "generalised epileptiform fits making their first appearance in an otherwise healthy subject in the fourth or fifth decades of life should at once raise a suspicion of intracranial tumour." In considering some localising symptom-complexes he devotes special attention to tumours in the neighbourhood of the optic chiasma, whose early recognition is of great importance for the preservation of vision. He is refreshingly critical of current loose conceptions of pathological sleep and "the sleep centre."

Any impartial worker cannot fail to be impressed with the revolution in the diagnosis of intracranial tumours which has been brought about by radiography. Not many years ago it was held to be useless to radiograph the skull in cases of suspected tumour because no abnormality was likely to be found. Since then we have learned that even if the tumour itself is invisible valuable clues as to its presence and situation are often provided by alterations in the bones of the skull, and the intraventricular or intrathecal injection of air has in many cases established the localisation of a growth when clinical methods have failed to do so. Dr. Walshe puts the case for the use of these accessory methods of investigation very fairly, rightly emphasising that they are supplementary to clinical methods. Advances in the surgery of the nervous system do not come within the scope of his review and little is as yet known concerning the value of therapeutic irradiation in the treatment of tumours of the nervous system. The important principle which underlies any method of treatment of intracranial tumour is that it must take full account of the pathological nature of the growth.

THE NEW CONVENTION ON NARCOTIC DRUGS.

THE conference on the limitation of the manufacture of narcotic drugs, which sat at Geneva from May 27th to July 13th, under the presidency of Mr. de Brouckère, of Belgium, concluded a new convention which is intended to "supplement" the Opium Conventions of 1912 and 1925 by seeking to render more effective the international control of the traffic in drugs of addiction. It will be remembered that the Geneva Convention of 1925, while reciting that "results of great value" had been produced by the original Hague Convention of 1912, nevertheless deplored that "the contraband trade in, and abuse of, the substances to which the convention applied still continue on a great scale," and accordingly sought "to complete and strengthen the provisions" of the earlier treaty. The draft of the new convention has now been published, and it may be well to consider in what respects it indicates an advance upon the international obligations already entered into by the high contracting parties.

The new convention, unlike those of 1912 and 1925, has little concern with raw opium or prepared opium, and deals mainly with morphine and cocaine and their derivatives. Article 2 defines "the drugs" to which the provisions are applicable, and the handiwork of the experts who advised the conference is evident in adding to morphine, diacetylmorphine, and cocaine and their salts the following: dihydrohydroxycodeinone, dihydrocodeinone, dihydromorphinone, acetyldimethylodihydrothebaine, dihydromorphine, their esters and salts. In a subgroup appear ecgonine, thebaine and their salts, benzylmorphine, and the other esters of morphine and their salts; while in a separate group are placed methylmorphine (codeine), ethylmorphine, and their salts.

Each contracting party is to furnish annually to the permanent central board estimates of the drugs required, distinguishing the amounts for use for medical and scientific purposes (including export), for conversion, for reserve stocks, and for Government requirements. The seven chapters and 34 articles of the new convention amount, in fact, to an elaboration of the provision contained in Article 9 of The Hague Convention, which reappeared as Article 5 of the Geneva Convention of 1925, which was as follows :—

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[1] Quart. Jour. Med., 1931, xxiv., 587.

> "The contracting Powers shall enact pharmacy laws or regulations to limit exclusively to medical and legitimate purposes the manufacture, sale, and use of morphine, cocaine, and their respective salts, unless laws or regulations on the subject are already in existence. They shall coöperate with one another to prevent the use of these drugs for any other purposes."

The foregoing restriction was also to apply to medicinal opium, to heroin, to all preparations containing more than 0·2 per cent. of morphine or more than 0·1 per cent. of cocaine, and to all new derivatives thereof and to other alkaloids of opium which may be shown to be liable to similar abuse.

The estimates furnished by the contracting parties are to be examined by an advisory body of four persons appointed respectively by the League's advisory opium committee, the central board, the health committee of the League, and the Office International d'Hygiène Publique. The estimates, with any explanations that may be vouchsafed, and any observations of the supervisory body, will be supplied to all the Powers concerned. Manufacture of any of the drugs in excess of the estimates is not to be permitted, due regard being had to imports and exports. Export of heroin, except to countries which do not manufacture it, and then only on import certificate and consignment to government, is forbidden. New drugs derived from opium or coca are not to be manufactured unless the government concerned is satisfied of their medical value; and if the health committee finds they are drugs of addiction they shall be subject to the provisions of this convention. Preparations containing less than 0·2 per cent. of morphine and less than 0·1 per cent. of cocaine, and preparations of codeine and ethylmorphine (with some reservations) are to be brought under control. Every year the permanent central board is to report for each country the estimates for each drug, together with the amounts consumed, manufactured, converted, imported, and exported. Explanations vouchsafed by any contracting party of failure to carry out his obligations will also be published, but not "in such a manner as to facilitate the operations of speculators or injure the legitimate commerce of any high contracting party." Each party is to create a "special administration" for applying the provisions of the convention, supervising the trade in drugs and "organising the campaign against drug addiction." Strict supervision over "raw materials" is to be required and drugs seized in illicit traffic are to be destroyed, converted into non-narcotic substances, or appropriated to medical or scientific use under government control. Particulars of each case of illicit traffic are to be communicated, through the secretary of the League of Nations, to the other parties to the convention.

The chairman of the conference claims that it has "succeeded," but it has to be remembered that it will not come into force until "90 days after the secretary-general of the League of Nations has received the ratifications or accessions of 25 members of the League of Nations or non-member States, including any four of the following: France, Germany, United Kingdom of Great Britain and Northern Ireland, Japan, Netherlands, Switzerland, Turkey, and United States of America." In the final act attached to the convention the governments are invited to consider the desirability of setting up State monopolies over the manufacture and trade in narcotic drugs, but the German delegation dissented from this proposal. A suggestion is also made as to the possibility of replacing heroin by a drug of less dangerous character. Finally an approximate estimate of the annual world requirements is tabulated as follows: morphine, 9 tons; heroin, 2 tons; cocaine, 5½ tons.

GANGRENOUS APPENDICITIS.

IT is gradually being recognised that there are two types of "acute appendicitis," one which without early operation rapidly goes on to perforation and general peritonitis, and the other which often subsides without surgical intervention, although it may be followed by recurrent attacks. This fact has led to the practice by some surgeons of the "delayed treatment" of acute appendicitis. D. P. D. Wilkie[1] has adduced evidence to show that the former type is primarily not an inflammation but an acute obstruction, and that all cases of gangrenous appendicitis are the sequel of an obstruction of the lumen, usually by a fæcolith. He states that while acute obstruction of the appendix is, without surgical treatment, a most deadly disease, acute inflammation of that organ is comparatively harmless. LaRoque[2] now puts forward a claim for the value of a sign, first noted by R. Brittain in 1928, in the diagnosis of gangrenous appendicitis. This sign is elicited by pressure on the right lower quadrant of the abdomen, especially at McBurney's point, when the right testicle is immediately drawn upwards. As a rule the testicle remains retracted until the pressure is withdrawn, it then returns to its original position. Occasionally, however, the testicle may drop back although pressure is maintained, only to retract again momentarily as the pressure is removed. Since the sign has been present in nearly 500 cases of gangrenous appendicitis, and has not been found in a series of more than 300 cases of other acute abdominal conditions, LaRoque regards it as pathognomonic of gangrenous appendicitis and an indication for immediate operation.

CARE OF THE INSANE IN IRELAND.

THE irony of Dean Swift's end has often been commented on, but it is seldom recognised that when "he gave the little wealth he had to build a house for fools or mad" he was endowing the first public hospital in Ireland to be wholly devoted to the care of the insane. In an interesting paper,[3] written for annual meeting of the Royal Medico-Psychological Society in Dublin, Dr. Kirkpatrick has described the scanty, and often barbarous, provision that existed prior to 1735, when Swift resolved to settle "his whole fortune to erect and endow an hospital for the support of idiots and lunatics." The matter went forward slowly. At first the mayor and aldermen of Dublin were named as trustees, but presently "upon the City's favouring Fanatics" the will was altered, and it was not until May, 1740, that it was signed in its final form. On August 16th, 1742, a writ *de lunatico inquirendo* was issued, and returned the next day, finding the Dean of St. Patrick's a person of unsound mind; three years later he died. In 1757 his intention was realised and the hospital declared open. For the next 50 years St. Patrick's continued to be the only hospital of its kind in Ireland, though the Houses of Industry in Cork, Dublin, Limerick, and Waterford sheltered many lunatics, along with prostitutes, incorrigible offenders, vagabonds, and others. In 1810 the Bloomfield Retreat was opened by the Quakers, following the example of their kind in York, and in the same year the Government made the necessary grant for building the Richmond Asylum; in both of these institutions humane and enlightened methods of treatment were employed from the first. During the next half century much was done, largely by Act of Parliament, so that in 1851 there were 11 district asylums, besides a number of private mental hospitals, so well managed as to earn the praise of Conolly of Hanwell. By 1900 the number of district asylums had been doubled and there was steady advance in many directions.

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[1] Bristol Med.-Chir. Jour., 1930, xlvii., 103.

[2] LaRoque, G. P.: Amer. Jour. Med. Sci., August, 1931, p. 191.

[3] A Note on the History of the Care of the Insane in Ireland up to the End of the Nineteenth Century. By T. Percy C. Kirkpatrick, M.D., Litt. D. Dublin: The University Press. 1931.

In Ireland, as elsewhere, the history of the care of the insane is for the most part a painful story of insensibility and cruelty, now happily ended; but in this case it is illuminated at its beginning by the remarkable regulations of the ancient Brehon laws, codified about the time of St. Patrick, in which appears an enlightened concern about the duties of the healthy community towards those "on whom the maddening wisp had been thrown," to use the old Irish phrase. The sagacious rules there laid down to prevent the insane from having offspring are nowadays of particular interest.

MENINGITIS DUE TO THE SPIROCHÆTE OF JAUNDICE.

LATELY several cases of meningitis in Paris have been traced to infection with the spirochæte of Weil's disease (*Leptospira icterohæmorrhagiæ*). In some of them there was no jaundice, and the diagnosis was suggested by the occupation of the patient, and proved by the high titre of the antibody reaction given by the patient's blood. One which is typical of the condition is described by Harvier and Wilm.[1] It was that of an exhibition diver at a restaurant, who became ill in December with evident signs of meningitis. Lumbar puncture gave an opalescent fluid with 350 cells per c.mm., 95 per cent. of which were polymorphonuclear leucocytes; it contained no visible bacteria, and cultures, on ordinary media, remained sterile. The patient recovered after repeated lumbar punctures in ten days' time, but five days later a second rise of temperature occurred, this time without meningeal symptoms. Schwarz, who has collected seven other non-jaundiced cases, describes the condition as an acute form of meningitis with severe contractures of the legs, but without herpes, petechial rash, or conjunctival congestion. The cerebro-spinal fluid may be opalescent on the sixth to the eighth day of the disease, if the meningeal reaction is severe, in which case the cells are chiefly polymorphonuclear, or it may be clear with a cell count either of mixed type or principally mononuclear. In other cases the meningitis has been ssociated with inflammation of other serous membranes—pleural, peritoneal, and synovial—which has cleared up without leaving any trace. The condition s one which might easily pass undiagnosed unless he possibility of spirochætosis were kept in mind, nd the fact that infection by the spirochæte may roduce symptoms other than jaundice is of importnce from the point of view of public health.

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[1] Bull. et mém. Soc. méd. des hôp. de Paris, 1931, xlvii., 893.

PYREXIAL TREATMENT OF CHOREA.

SOME two years ago a drug called Nirvanol was introduced for the treatment of chorea.[1] Eight to 14 days after administration is begun it produces a reaction in the form of fever, rash, general malaise, and an eosinophilia. Treatment is immediately suspended, and the chorea improves as the reaction subsides. Occasionally, however, the sequels of the reaction are not so happy, as is emphasised by F. Goebel,[2] who has seen purpura hæmorrhagica, nephritis, and a fatal case of dermatitis *exfoliativa* following the exhibition of nirvanol for chorea. He points out that although this drug is effective in treating the disease, it cannot be recommended with confidence, since it may actually cause death, and such a catastrophe can at present be neither foreseen nor prevented. Most observers think that the improvement in the chorea is not directly due to the fever so produced, since similar improvement may follow apyrexial reactions. L. P. Sutton,[3] however, now describes 25 cases of chorea in which rapid and striking amelioration followed pyrexial therapy. In the first case the fever was the result of accidental overdosage with phenobarbital, and the improvement which followed prompted the further investigations. The other 24 cases were treated by intravenous injections of typhoid-paratyphoid vaccine administered daily for as long as six or seven days, the dose being graduated so as to produce a febrile reaction lasting six to seven hours with each injection. Under this régime the average duration of symptoms after the onset of treatment was eight to nine days. The advantages claimed for this method are that it causes fever immediately, is capable of producing it in any patient, and is not complicated by rashes or other disturbances.

ENCEPHALITIS FOLLOWING VACCINATION OR EXANTHEMS: A REQUEST TO PRACTITIONERS.

THE Ministry of Health has issued a statement asking medical practitioners to help in maintaining full investigation of nervous manifestations (meningitis, encephalitis, polio-encephalitis, &c.) developing within four weeks of vaccination. A similar request in 1926 provided material for the consideration of the Rolleston committee. Having issued two reports[4] the committee has now ceased work, but particular study of these rare cases is still required. Furthermore, the Ministry now wants information about cases of acute disease of the nervous system following acute infections, such as measles, German measles, chicken-pox, whooping-cough, or influenza; for the Rolleston committee noted that such conditions bear a close pathological resemblance to post-vaccinal encephalitis and demand continued study and comparison. Communications of the kind requested, if received in time, will permit of local inquiry to ascertain clinical details which may not subsequently be obtainable, and will sometimes enable the department to arrange for expert post-mortem examination and pathological examination of specimens. Practitioners are therefore asked to report without delay every case of disease of the central nervous system with an acute onset within four weeks of vaccination or immediately following an acute infectious illness. The intimation should be sent to the Senior Medical Officer, Med. I., Ministry of Health, Whitehall, London, S.W.1.

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[1] See Poynton, F. J., and Schlesinger, B. E.: THE LANCET, 1929, ii., 267.

[2] Deut. Med. Woch., July 31st, p. 1313.

[3] Jour. Amer. Med. Assoc., August 1st, p. 299.

[4] Report of the Committee on Vaccination, Cmd. 3148. See THE LANCET, 1928, ii., 233. Further Report of the Committee on Vaccination, Cmd. 3738. See THE LANCET, 1931, i., 85, 97.

The statement adds that the Lister Institute has prepared an antivaccinal horse serum, doses of which can be supplied on application to the Ministry. It also calls attention to a reference, in the report of the Committee on Vaccination, to the success which has been obtained in certain cases by the treatment of post-vaccinal encephalitis by intravenous injection of serum derived from persons who have been recently vaccinated.

EARLY CARDIAC FAILURE.

WHEN there is a long history of diminished cardiac reserve, and one finds localised or generalised œdema, evidence of stasis in the liver and lungs, and definite pathological signs in the heart itself, the diagnosis of cardiac failure is simple. But this is an end-result, an acknowledgment of defeat by the patient and by his doctor, and to-day, when the prevention and early diagnosis of disease is rightly emphasised, and when heart failure is still responsible for the deaths of many men and women at the height of their mental abilities, we must focus attention chiefly on the early condition. A recent review by Prof. L. Bogendörfer[1] shows that the greatest importance, as Mackenzie taught, is still to be attached to an accurate history; it is essential at the same time to make a close study of the patient's mentality, for otherwise symptoms due in reality to early cardiac failure may easily be attributed to neurosis. Bogendörfer describes tests for the estimation of cardiac function, but since Nature knows no average, attempts to estimate cardiac reserve by counting the *absolute* increase of the pulse-rate after exercise such as knee-bending are likely to fall to the ground. The same applies to blood pressure and the quality of the pulse; the latter is often used to gauge the power of the heart, but actually it depends not only on the volume per beat of the heart, but also on many arterial factors. Repeated examination of the same patient, however, may be very valuable. Less often emphasised, but well worth attention are minor disturbances of water metabolism. The heart normally works with part only of its available power; with increased needs reserve powers which the healthy heart can easily and rapidly supply are called into play. With ordinary daily wear and tear the reserve power of the heart becomes insufficient, and water tends to be stored in the body by day, only to be excreted at night. Hence the importance, as Quincke pointed out, of nocturnal enuresis as an early symptom. The body, Bogendörfer points out, can retain considerable amounts of fluid without the development of visible œdema, and even 4–7 litres accumulated may give rise to no signs of œdema or transudate into the body cavities. This latent œdema, he says, can only be unmasked by the regular use of the weighing scales and with the estimation of intake and output of fluid. Kauffmann has shown in apparently fully compensated heart disease that raising the end of the bed will result in increased secretion of urine; 5 oz. of tea are given hourly to the patient lying flat in bed and the bladder is emptied hourly; after four hours the foot of the bed is raised and the patient is kept in this position for two hours, urine again being passed hourly. Small amounts of rather more highly coloured, acid urine, with a higher specific gravity, perhaps containing a trace of albumin, are passed in the first period; an increased amount of urine of low specific gravity passed in the second period is a certain sign of latent œdema. Attempts have also been made to estimate cardiac reserve by determining how long a patient at rest can hold his breath after full expiration; he then is exercised by a quick walk and again holds his breath after full expiration. The time taken depends partly on volition, but also to a large extent on the rapidity with which carbon dioxide accumulates in the blood.

SCARLET FEVER IN INDIA.

IT is not so many years ago that enteric fever was supposed to be rare amongst Indians. This belief, owing to blood tests and more frequent post-mortem examinations, is now exploded, and it appears that the impression, widespread until recently, that scarlet fever is almost if not entirely non-existent amongst Indians, must go the same way. It is at any rate seriously challenged[1] by Dr. P. T. Patel, who is in charge of the principal infectious diseases hospitals in Bombay. Few physicians can have practised for many years in India without occasionally coming across a sporadic case having all the classical features of scarlet fever, but such cases are almost always in Europeans, and it is usually impossible to trace their origin. Leonard Rogers remarked (1919) that scarlet fever occurs in India as an imported infection, that there is no evidence that it is an indigenous disease, and that it rarely if ever attacks Indians. This is the view that has hitherto been generally accepted. From time to time, however, cases resembling scarlet fever have been reported in Indians, and in 1920 K. Macleod came to the conclusion that the disease did affect Indians, though showing no disposition to become epidemic among them. Since then isolated cases have been repeatedly observed in Bombay and elsewhere, and Dr. Patel is now definitely of opinion, from his own observation, that scarlet fever is indigenous in India, and he quotes many cases in support of this view. The suggestion is made that climatic conditions have modified the disease, and it is clear that the rash may easily be overlooked on a dark skin.

ARISTIDES AGRAMONTE.

Dr. Agramonte, who has just died of heart disease at New Orleans at the age of 62 years, was the last survivor of the four actors in a brilliant episode in the story of yellow fever. With Walter Reed, James Carroll, and Jesse Lazear, he was sent by the Surgeon-General of the United States Army to Cuba in June, 1900, to investigate the epidemic of yellow fever then raging there. The sequel is well known. Two of the commissioners, along with other volunteers, lived among yellow fever patients in wards from which mosquitos were excluded, and remained free from infection even though surrounded by the excreta and vomit of these patients, proving that transference of the disease takes place normally through the bite of the mosquito alone. Dr. Agramonte was a native of Cuba and left the island at 2 years of age when his father was killed by Spanish troops. He qualified at Columbia College in New York in 1892, and soon after became bacteriologist to the Board of Health. In 1901 he was transferred to the University of Havana, leaving that post to be head of the department of tropical diseases at the new medical school of Louisiana State University. This summer he was elected president of the Pan-American Medical Congress to be held next year in New Orleans.

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[1] Zeit. für Ärztl. Fortbild., May 1st, p. 288.

[1] Indian Med. Gaz., June, 1931.

SPECIAL ARTICLES

STUDIES OF THE MECHANISM OF UPPER RESPIRATORY INFECTION.

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For many years investigators have sought to discover the ætiology of the common cold. Many organisms have at different times been assigned a causative rôle, and frequently the evidence in favour of one or another agent has been impressive. In general, however, such organisms have seemed to be of local importance, and not to have had a universal significance. Many of the organisms described are well-recognised pathogens of the upper respiratory tract, and their importance is apparent to all students of upper respiratory disease, but none has an established position as the principal initiating agent of upper respiratory infection. Our own studies of this type of infection have led us to believe that the visible bacteria that can be more or less readily cultivated from the upper respiratory tract during infection are not of primary significance, but must for the most part be assigned the rôle of secondary invaders.

Important evidence has already been accumulated suggesting that the primary agent of the simple type of respiratory infection that goes by the name of the common cold may belong to the order of the ultra-microscopic viruses.[1] The studies which we have carried out offer definite evidence in support of this point of view.

Observation has confirmed the opinion that anthropoid apes, particularly the chimpanzee, are susceptible to acute upper respiratory infections that resemble in every respect the same type of infection in man. Such infections are readily communicable from man to the ape, and from ape to ape. Study of the bacterial flora of the upper respiratory tract in chimpanzees shows it to resemble that of man to a remarkable degree. These animals, therefore, should prove to be excellent animals for study of the experimental transmission of acute upper respiratory infections. Such in fact has proved to be the case.

EXPERIMENTAL INFECTION IN APES.

A colony of young chimpanzees was assembled and placed under observation. To guard against accidental infection the animals were kept in specially organised rooms under rigid quarantine whenever experimental procedures were in progress. When such animals are inoculated intranasally with bacteria-free Seitz filtrates of nasopharyngeal washings from individuals with acute colds, within from 24 to 48 hours the apes begin to manifest signs of upper respiratory infection. These signs are clearly objective, and consist of sneezing, coughing, nasal obstruction, and a mucoid or muco-purulent nasal discharge. These phenomena persist for from five days to two weeks. Such experimental infections are readily communicable by contact to healthy chimpanzees placed in the same cage, and can be passed experimentally from animal to animal by the technique described. Experiments of this nature have been successfully performed over a period of several years and leave no doubt that the infection in question is communicable by means of a filtrable agent.

Perhaps the most significant change, from a bacteriological standpoint, has been the increase of activity on the part of the potential pathogens habitually present in the throat flora of the apes. Coincident with the appearance of symptoms, pneumococcus, *Streptococcus hæmolyticus*, *Bacillus pfeifferi* have developed in greatly increased numbers, and have spread over a wide area of the nasopharyngeal mucous membranes. These organisms become at this time conspicuous even in the nose where they are seldom or never present under normal conditions. We have also observed that during the period of acute infection animals who carry hæmolytic streptococcus may readily communicate this organism to contact animals. Such transference does not easily take place from carrier to contact in the absence of acute respiratory infection in the carrier animal.

EXPERIMENTAL INFECTION IN MAN.

Studies of experimental transmission of colds have also been carried out with human subjects. Human volunteers were carefully isolated and inoculated intranasally with bacteria-free filtrates from individuals suffering from acute colds. After an incubation period of about 24 hours the inoculated subject has manifested the signs of the common cold, and has run a typical course of symptoms lasting from one to two weeks. Such experimental colds in human beings have been passed in series from individual to individual. These human experimental colds differ bacteriologically from the experimental cold in the chimpanzee in that there is no immediate evidence of increased activity on the part of the potential pathogens harboured in the human nasopharynx. The same difference in bacterial activity is manifest between the spontaneous cold in the chimpanzee and the spontaneous cold in human beings.

THE VIRUS IN VITRO.

When we had satisfied ourselves that the common cold is caused by a filtrable virus, our next efforts were directed toward cultivating the causative agent in vitro. The first steps in the successful carrying out of such a procedure must naturally be directed toward an attempt to preserve the virus in an active form outside the animal body.

In order to test survival of the virus after removal from the human body, nasopharyngeal washings were obtained in the manner previously described from individuals within the first 24 hours of a typical attack of common cold. The material was quickly passed through a Seitz filter, and the filtrate was subsequently tested for its capacity to induce the symptoms of the common cold in chimpanzees and in human volunteers. The filtrates with cystein hydrochloride added were preserved anaerobically under vaseline seal both at room and at ice-box temperature. In a few instances the filtrate was concentrated to approximately one-seventh its original volume by vacuum distillation. Of 12 inoculations of filtrates preserved in this manner nine have produced in the inoculated subject typical symptoms of the common cold. The duration of time of preservation of active filtrates has ranged from 4 to 13 days. Tests of survival beyond the thirteenth day have not been made. Positive results have been obtained with filtrates kept at room temperature, and with those kept at ice-box temperature, and with both the unconcentrated filtrate and with that concentrated by vacuum distillation. From these experiments we conclude that the virus of the common cold survives under suitable conditions for at least 13 days after removal from the human body.

In view of the capacity of this virus to survive in what might be considered an adverse environment an effort was next made to cultivate the agent in living tissue medium. Foster[2] has previously reported the cultivation of an organism from patients suffering from the common cold. The method of culture chosen by us has been that developed by Maitland and Maitland,[3] and by Li and Rivers.[4]

Ten-day chick embryos are hashed and suspended either in Tyrode's solution or in buffered bouillon prepared from a special peptone,* and to which 0·1 per cent. gelatin has been added. All solutions, both those used for nasopharyngeal washing and for cultivation, contain 1 to 2000 cystein hydrochloride. At all times an effort has been made to protect the agent against the deleterious action of peroxides. The cultures were incubated under vaseline seal at 37° C. for from four to nine days.

The material used for cultivation was obtained in the following manner: nasopharyngeal washings were made from a patient with a typical cold of more than moderate severity. The washings were passed through a Seitz filter and preserved at ice-box temperature under vaseline seal in the special peptone broth described. On the ninth day of preservation a volunteer was inoculated intranasally, and within 24 hours developed typical symptoms of the common cold. As soon as the signs of the disease were well marked, nasopharyngeal washings were prepared in the usual manner and preserved for five days at ice-box temperature. After this interval a second volunteer was inoculated, who also developed symptoms of a cold within the usual incubation period. Nasopharyngeal washings were again prepared, filtered through a Seitz filter, and concentrated by vacuum distillation. After ten days' preservation at ice-box temperature a third volunteer was inoculated. This individual developed a cold of unusual severity, possibly indicating an accession of virulence by the virus. Nasopharyngeal washings were prepared from this individual after the usual interval, filtered through a Seitz filter, concentrated seven times by vacuum distillation, and preserved for five days at ice-box temperature. After the lapse of this interval 0·25 c.cm. of the concentrated material was inoculated into tissue medium of the nature described. The culture was incubated for five days at 37° C. At the end of this time a human volunteer was inoculated and within the usual incubation period developed a cold with symptoms of rather a mild character.

From this time on the material was carried in tissue medium and transferred at intervals of from three to nine days. We believe the preferable interval between transfers to be four days. From time to time cultures were chosen for the inoculation of experimental subjects. The third culture representing a dilution of the original material of approximately 1–2000 was inoculated into a chimpanzee. This animal developed symptoms of a cold after an incubation period of four and a half days. An uninoculated companion animal kept in the same cage developed symptoms of a cold at the same time. The sixth culture, representing a dilution of the original material of approximately 1–2,000,000, was inoculated into three human volunteers. Of these, two developed after 24 hours typical colds of moderate severity. The tenth culture, representing a dilution of the original material of approximately 1–20,000,000,000, was inoculated into three human volunteers. Of these, one developed such mild symptoms of respiratory infection as to be considered doubtful. The twelfth culture, representing a dilution of approximately 1–2 trillion, was inoculated into three human volunteers, and of these one developed a cold of mild symptoms. The fifteenth culture, representing a dilution of approximately 1–2 quadrillion, was inoculated into three human volunteers. Of these, two developed colds of unusually severe symptoms, complete nasal obstruction, frontal headache, malaise, loss of appetite, nasal discharge, and pronounced cough. Nasopharyngeal washings were prepared from these two individuals, filtered through a Seitz filter, and concentrated by vacuum distillation. Two human volunteers were inoculated after a short interval with these concentrated filtrates and within 24 hours both developed colds, one with mild symptoms and the other with the typical features of a head cold.

DISCUSSION.

The evidence presented by these experiments indicates that the virus of the common cold survives for a considerable length of time after removal from the human nasopharynx, and that the agent reproduces itself in vitro when cultivated in suitable tissue medium. The total duration of life of the culture virus from the time of removal from the human subject has been 74 days. The final dilution of the original material is so great as to rule out conclusively the presence of any significant amount of the original virus. Controls of the constituents of the medium and of the tissue medium have been negative. In one instance when a volunteer received active culture heated for half an hour at 80° C. there appeared symptoms of upper respiratory irritation which lasted for less than 24 hours.

From these studies the conclusion may be drawn that one type of acute upper respiratory infection is caused by a filtrable virus. In addition to initiating the symptoms of infection this agent may be considered to provoke increased activity of any potential pathogens that may happen to be present in the respiratory tract, and, furthermore, to render the respiratory tract susceptible to implantation by pathogenic organisms from the exterior. An interesting observation in connexion with this point of view is that in individuals stigmatised with rheumatic disease many times a recrudescence of the rheumatic process is occasioned by an attack of the common cold. From the above observations the inference may be drawn that the virus of the common cold in the individual plays the double rôle of initiator and promoter of upper respiratory infection.

The significance of this virus in the ætiology and epidemiology of respiratory infection of the community as a whole is still obscure, but certain interesting facts indicate its great importance. Studies [5] of outbreaks of common cold in representative population groups show a high morbidity-rate for this infection of cyclic character. The peaks of incidence are three in number, and occur in the early fall months, September and October, the mid-winter months, January and February, and the spring months, April and May. The character of the different outbreaks varies in severity, and there seems to be a progressive increase in the seriousness of the secondary infections of the respiratory tract as the winter advances into spring. For example, the amount of absenteeism from work is much greater during the January outbreak than during the October outbreak. The incidence of the pneumonias is higher during the *former period than* during the latter. Furthermore, since the pandemic of influenza in 1918, all outbreaks of influenza in New York City have occurred in the early months of the year, thus coinciding in time with one of the periods of maximum incidence of the common cold. Studies conducted by us have shown, considering the respiratory year, so to speak, as running from September to June, that as this year advances there is an increasingly wide distribution in the nasopharynx of healthy individuals of such potential pathogens of the upper respiratory tract as pneumococcus, *B. pfeifferi*, and *S. hæmolyticus*.

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* Especially prepared peptone obtained through the kindness of Dr. René Dubos, of the Hospital of the Rockefeller Institute.

The interpretation of these observations is not yet clear, but it seems not unlikely that as a consequence of the repeated cycles of common cold throughout the respiratory year an increasing opportunity is afforded the potential and sometimes secondary pathogens of the respiratory tract to cause infection. As a result of this their distribution is promoted and their virulence perhaps enhanced. This type of associated activity makes it seem not unlikely that certain outbreaks of so-called influenza or grippe may result from the coincidence of an epidemic outbreak of the common cold, with a period of wide distribution and increased virulence of the well-recognised pathogenic organisms of the upper respiratory tract. However this may be, there is no doubt that the virus of the common cold plays a most important rôle in promoting respiratory infection in the community as a whole, in addition to its obvious significance in respiratory infection in the individual.

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PARIS.

(FROM OUR OWN CORRESPONDENT.)

TROPICAL MEDICINE AT THE COLONIAL EXHIBITION.

THE Journées Médicales Coloniales at the Colonia Exhibition at the end of last month (July 22nd–31st constituted a veritable international conference on tropical medicine. It opened in the great hall of the Cité des Informations under the chairmanship of Marshal Lyautey, who paid this tribute to medicine —that in many cases it had been able to replace battalions in the pacification of new countries. Prof. Tanon outlined the programme of the conference, which he hoped would prove a milestone in the evolution of tropical hygiene. The number and standing of the official delegates from Great *Britain* and her dependencies showed how great was the importance attached to it in this quarter.

Among the numerous and most interesting reports presented was one by Dr. A. Thiroux on birth-rate and infant mortality in the French colonies. It was based on the study by Colonel Cazanove, presented in 1930 to the Office International d'Hygiène Publique. The birth-rates showed remarkable local differences, ranging as they did from 7 to 84 per 1000, *the last-named* prodigy of fecundity being claimed by a district in the Cameroons. The infant mortalities also showed wide fluctuations, ranging from 155 to 319 deaths in the first year of life *for every 1000 live* births. He headed the list of the causes of death in infancy with malaria, giving as an example the findings in Antananarivo of malarial enlargement of the spleen in 77 per cent. of the school-children. In a paper on sleeping sickness in French equatorial Africa, Dr. A. Sicé stated that among 830,448 natives inspected in 1929 the morbidity-rate from this disease was about 4 per cent. After enumerating a list of measures and remedies, he concluded that trypanosomiasis has ceased to be a danger for the economic future of French equatorial Africa. Other speakers dealing with trypanosomiasis in French occidental Africa stated that on the whole, and since 1920, this disease has waned, although here and there it has gained new ground. The reports on the prevention and treatment of leprosy showed how great have been the changes of late years in the attitude of medical science towards it. Dr. Stevenel discussed recent experiences with chaulmoogra oil, the only drug which, in his opinion, has hitherto proved indubitably effective, and with regard to prophylactic measures he insisted that they should not be more cruel than those now recommended in tuberculosis. Dr. Thomas Cochrane, discussing the prophylaxis of leprosy in the British African Colonies, also showed how impossible it would be, physically and financially, to apply measures of strict isolation to the five to ten million lepers supposed to be living in the world to-day.

A CONGRESS OF DENTISTS.

The eighth International Dental Congress, which opened on August 2nd at Versailles, under the patronage of the President of the Republic, was held during the following days in the Grand-Palais in Paris. More than 3000 persons took part, and 33 governments sent official representatives. The President, Dr. G. Villain, in his opening address, traced the history of dentistry since the congress last sat in Philadelphia in 1926. Up till then dentistry had been overshadowed by a vogue which traced an infinite number of evils to the teeth themselves, the medical profession in many countries taking such a wholesale and severe attitude towards the alleged sins of the teeth that their extraction had become the most habitual therapeutic act, and the dentist had found himself "demoted" to the elementary rôle of tooth extractor. Dr. Villain considered that the fortunate passing of this crisis had led, in the course of the last five years, to the development of research into prosthetic restoration. Another important development in dentistry during the last five years was, in his opinion, the work of Mellanby and others on the relation of caries to metabolism and diet.

THE LICENSED BROTHEL.

It *is* pretty safe to prophesy that if and when the *official* regulation of prostitution is discontinued in France this change will be due not so much to the experience of other countries as to the tentative experiments now being made here and there in France itself. The abolition of the controlled brothel in Grenoble is being followed with the keenest interest by the abolitionists and their opponents, who keep up an interesting correspondence in the *Siècle Médical.* Meanwhile the town of Nancy has decided to follow suit, and its mayor has issued an order closing all the *maisons de tolérance,* whose licences are to be withdrawn on Nov. 1st.

UNITED STATES OF AMERICA.

(FROM AN OCCASIONAL CORRESPONDENT.)

POLIOMYELITIS.

SOMETHING like an epidemic of poliomyelitis has made its appearance in certain of the Middle Atlantic States and shows a tendency to spread westward. The increased incidence was first noted in New York City during the week ending July 25th, in which 195 cases were reported, as compared with 35 cases for the first six months of the year. A sharp rise in incidence was also reported at the end of July by the Connecticut State Department of Health. During the first half of August the incidence of poliomyelitis in the state of Illinois has been three times the expectancy. Although this does not represent a rise comparable to that in the east it shows a tendency for the disease to spread along the line of travel.

Various State health departments have taken measures to meet the threatened attack. Connecticut, New York, and Illinois are providing consultant diagnostic service and immune serum. In Connecticut serum has been obtained from the Newington Home for Crippled Children. In New York State appeals for blood from those who have had the disease have been broadcast, and Governor Roosevelt has set an example by giving, for the second time, some of his own blood. Hospitals are advised to be prepared to take cases under conditions of isolation and to provide themselves if possible with a Drinker respirator for the treatment of cases with bulbar paralysis.

A conference of New England health officials was held in Boston on August 3rd. At its close a statement was issued warning parents that "Perhaps the most suggestive early sign warranting attention is a stiffness of the spine and neck in a sick child, best shown when the child is asked to sit up in bed and bend the head forward between the knees. Infantile paralysis," it is stated, "is spread by personal contact with patients or healthy persons carrying the infection. Children's contacts therefore should be restricted to the usual groups of associates. Camps and children's institutions are advised to discourage visiting by outsiders. Children now in camps under controlled conditions and observation had better stay there rather than increase their contacts by leaving." Even as far west as New Mexico warning circulars have been sent to the medical profession advising of the chief diagnostic symptoms of poliomyelitis in the prodromal stage and of the significant laboratory findings in these early cases.

DEATH OF LEE KAUFER FRANKEL.

By the death in Paris on July 25th of Lee K. Frankel, Ph.D., America loses one of its outstanding leaders in public health. He was for nine years manager of the United Hebrew Charities of New York, and then for a short time special investigator for the Russell Sage Foundation. But it was in 1909, when he joined the staff of the Metropolitan Life Insurance Company and organised its welfare division, that the nation as a whole began to feel the impress of his influence. The work which he organised, both in educational literature and particularly in the public health nursing service, was quite original as a contribution of insurance practice and extremely influential in promoting public health. Dr. Frankel was vice-president of the National Tuberculosis Association in 1914, president of the American Public Health Association 1919, and of the National Health Council, child of his own organising genius, from 1923 to 1926. The Framingham tuberculosis demonstration was another invention of his fertile mind. Numerous public health organisations benefited from his advice. At the time of his death he had recently completed a survey of social insurance in Europe.

IRELAND.

(FROM OUR OWN CORRESPONDENT.)

POOR-LAW SALARIES IN COUNTY WEXFORD.

THE County Wexford board of health has been informed by the Department of Local Government and Public Health that owing to the continued neglect of the board to fix a suitable scale of salaries for the dispensary medical officers of the county, the Minister felt constrained to issue an order fixing the salaries of these officers. The salaries were now determined to be on a scale beginning at £200 a year, and increasing by £5 a year to £300 a year, to be applied retrospectively. The order was not to affect any existing officer adversely. The sealed order was enclosed. The order affects eight medical officers, and brings about a total increase of £390 a year. With a scale of salaries established in Wexford, there is now a scale in force in every county in the Irish Free State. There are, however, considerable differences between the scales in different counties.

THE DERBY SWEEPSTAKE.

The Irish Hospitals Trust published last week a financial statement concerning the sweepstake on the Derby. The total receipts, after deducting £38,000 for sellers' prizes, came to £2,789,696. Of this sum £697,424, or 25 per cent., was distributed to the hospitals; £1,902,500, or 68·2 per cent., was spent in prizes; and £189,772, or 6·1 per cent., went in expenses. Of the latter sum, £58,266 was paid to Hospitals Trusts, Ltd., as promoters of the sweepstake. The grants to hospitals were divided among 34 institutions. The highest grant was £48,819, or 7 per cent. of the total, which was given to the Royal City of Dublin Hospital. Five hospitals—Sir Patrick Dun's, Meath, Richmond, Cork Street, Coombe—got 6 per cent., or £41,845 each. Various grants were given to the others, the smallest grants, 0·5 per cent., or £3487, reaching the Martin Hospital, Portlaw, and the Drogheda Memorial Hospital, The Curragh. Preparations are far advanced for the sweepstake on the Manchester November Handicap. The list of participating hospitals has not yet been compiled.

THE METROPOLITAN HOSPITAL.—The annual report of this institution (Kingsland-road, E.) states that serious defects in the fabric have been discovered. The fire staircase must be renewed at once, and fractures in the main structure, necessitating repairs of considerable magnitude, must be put in hand shortly. The cost of these works will be between £6000 to £7000, and an effort is to be made to raise this sum before launching the general appeal that is in contemplation. When that appeal is made over £50,000 will be asked for to pay off the debt of £18,000 on the nurses' home and to meet the cost of essential improvements.

PANEL AND CONTRACT PRACTICE

ETHICS OF CONSULTATION.

At the annual panel conference in October last attention was given to smooth working of additional benefits under the N.H.I. Acts, and particularly to the relation of panel practitioner to consultant in his various guises. It seemed to the representative of East Sussex for instance that his patients were apt to disappear into sanatoriums, rheumatic clinics, and other forms of special treatment, and return to him later without any information on treatment received or advice given. He thought, and the conference agreed with him, that the accepted ethics of consultation should apply to all these situations in insurance practice. The matter was referred to the central ethical committee of the British Medical Association which decided that the rules drawn up for private practice applied equally well to insurance practice if read in conjunction with the rules guiding the practitioner when called upon by a third party to make an examination. The two sets of rules which are of fundamental importance appear as Appendix C to the report of the Insurance Acts Committee printed in the Supplement to the *British Medical Journal* for August 29th. In these rules the term "consultant" is to be understood as meaning any practitioner who is called upon by the patient or by any person acting on behalf of the patient, to advise in special circumstances with regard to a patient who is already under the care of another practitioner, that other being referred to as the "attending practitioner."

WHERE CONSULTATION IS REQUIRED.

In the interests alike of the public and of the medical profession, it is the duty of a medical practitioner to accept the opportunity of consultation, especially upon obscure and difficult cases, or where the patient or his friends desire it.

In the following cases it is especially the duty of the practitioner in attendance to endeavour, if practicable, to obtain the assistance of another opinion:—

(*a*) When a question arises of the propriety of performing an operation or adopting some course of treatment which may be dangerous to life or permanently injure the condition of the patient, especially if the condition which it is thought to relieve by this treatment be not itself dangerous to life.

(*b*) When a question arises of destruction of a fœtus, or unborn child, in the interest of the mother, especially if she is not in labour.

(*c*) When the practitioner in attendance is in doubt either as to the diagnosis or as to the treatment to be followed, and delay in arriving at a decision might be dangerous.

(*d*) When there is evidence of anxiety on the part of the patient or his friends as to the correctness of a diagnosis or of the treatment pursued.

(*e*) When the attending practitioner has reason to suspect:—

(i) Performance of an illegal operation.
(ii) Administration of poison.
(iii) Commission of any other criminal offence.

CHOICE OF CONSULTANT.

It is expedient in the interests of the patient that the choice of consultant should usually be left to the practitioner in attendance. Nevertheless, a practitioner is not justified in refusing to meet a consultant selected by the patient, or the patient's friends, unless he is satisfied that the proposed consultant is not qualified by knowledge or special experience to advise upon the case, or that he is one of whom he is debarred from meeting. It is the duty of a practitioner to refuse to meet in consultation:—

(*a*) An unregistered person.

(*b*) A practitioner whose exclusive profession of any peculiar system of treatment would render consultation futile.

(*c*) Any practitioner whose conduct has, after due inquiry, been declared by some recognised body of the medical profession to be detrimental to the honour and interests of the profession, such declaration not having been made inoperative by any subsequent pronouncement of the body in question or of any superior ethical tribunal.

PROCEDURE AND ETIQUETTE.

The arrangements for consultation should be made by the attending practitioner. If a practitioner receives an application to act as consultant from any person other than the attending practitioner of the patient, he shall *not* see the patient without the consent of the attending practitioner. The following rules should be observed, unless there is substantial reason in any particular case for departing therefrom:—

(*a*) If the consultation is not held at the patient's house, it generally takes place at the house of the practitioner consulted, who also fixes the hour of meeting, unless otherwise amicably arranged.

(*b*) All parties to a consultation should be punctual. If the attending practitioner does not keep the appointment, the other or others may, after a reasonable time, see the patient, and leave his, or their, conclusions in writing, in a closed envelope addressed to the attending practitioner.

(*c*) Before seeing the patient, the attending practitioner should, as a rule, give the consultant a brief history of the case.

(*d*) On entering the room of the patient, the attending practitioner should precede the consultant, and should, if necessary, introduce him to the patient, and the attending practitioner should be the last to leave the room. The diagnosis, prognosis, and treatment should be discussed in private.

(*e*) The opinion on a case, and the treatment, should be communicated to the patient or the patient's friends by the medical man consulted, in the presence of the attending practitioner.

(*f*) If it is found necessary that the patient or his friends should be made aware of a difference of opinion among the practitioners taking part in a consultation, it is the duty of the consultant, jointly with the attending practitioner, to communicate this information.

(*g*) The practitioner in attendance should ascertain previously, and inform the patient or his friends, as to the amount of the fee, which should be paid to the consultant at the time.

(*h*) If for some reason a personal consultation is impossible, the attending practitioner should write a letter introducing the case, and should courteously and punctually reply to any communication from the consultant, and the latter should write and forward his opinion, along with any prescription he may advise, in a closed letter addressed to the attending practitioner.

(*i*) Arrangements for a future consultation should be left to the initiative of the practitioner in attendance.

RELATION OF CONSULTANT TO PATIENT.

Great care should be exercised in making any observations in the presence of the patient on the nature of the malady, its probable issue, or treatment pursued, and all criticisms or reflections on the practitioner in attendance must be avoided. Differences of opinion, so long as there is final agreement among the parties to the consultation, are not to be revealed, but if agreement as to diagnosis and treatment should not be possible and the consultant is convinced that the future well-being of the patient is concerned in his so doing, he should inform the patient in the manner prescribed above.

It is the duty of the practitioner in attendance loyally to carry out the measures agreed upon at the consultation, and he should refrain from making any radical alteration in such measures except upon urgent grounds or after adequate trial.

In recognition of the position of trust in which he is placed towards the attending practitioner, the consultant must not, by unduly ingratiating himself *or otherwise, attempt to secure for himself a patient*, or the relative of a patient, whom he has seen in consultation, and must exercise scrupulous care to avoid disturbing the confidence of the patient in the attending practitioner.

If the consultant wishes to make any communication with regard to any case which he has seen in consultation, he should only do so through the attending practitioner, and should not discuss the case with the patient or any of the patient's friends, in the absence, or without the consent of, the attending practitioner.

A practitioner who has seen a case in consultation should not supersede the attending practitioner during the illness with regard to which the consultation is held, and, if he be asked to attend or prescribe in any future illness he should only do so after explanation with the attending practitioner, unless circumstances make this impracticable.

Third Party Consultations.

There remains to consider the special case of patients under care of other practitioners. Rules in respect of position of medical practitioners called upon to examine, otherwise than by request of patient or persons acting on patient's behalf, are as follow. They do not apply to certifying factory surgeons.

NOTICE OF VISIT.

The medical inspector should give the medical attendant such notice of the date, time, and purpose of his visit as will afford reasonable opportunity for the medical attendant to be present should he or the patient so desire. Exceptions are :—

(*a*) When circumstances justify a surprise visit.

(*b*) When circumstances necessitate a visit within a period which does not afford time for notification.

(*c*) When the medical inspector, after due inquiry made, has no information as to whether the patient is under medical care.

Where the medical inspector has availed himself of any of the above exceptions, it shall be his duty to inform the medical attendant, if any, of the fact of his visit, and the reasons for his action.

THE VISIT ITSELF.

The medical attendant must not put any unnecessary difficulties in the way of fixing a time convenient to both practitioners. If the medical attendant fails to appear at the time stated, the medical inspector may proceed with his examination forthwith. The medical inspector must not, without the consent of the medical attendant, do anything in the course of his examination which involves active interference with the treatment of the case. Where the medical attendant fails to communicate with the medical inspector, the medical inspector shall at his discretion and subject to the consent of the patient, make any examination he may consider necessary.

THE REPORT.

The medical inspector must not make any comments to the patient which are of the nature of criticisms of, or reflections upon, the treatment, nor must he express, without the concurrence of the medical attendant, any opinion to the patient as to the ætiology, diagnosis, or prognosis of the case. His duty is strictly confined to examining into such matters as are necessary for the purposes of his report, and reporting to his employer, and to his employer only, his conclusions from such examination.

If the medical inspector finds it necessary to report to his employer that any modification in the treatment which is being carried out is, in his opinion, necessary to the more rapid recovery of the case, he shall, if possible in the first instance, so inform the medical attendant.

MEDICINE AND THE LAW.

Professional Registration—The Architects' Success.

STATUTORY registration, a principle of proved value for establishing professional standards in the public interest, has now been applied to architects. The Medical Act, rather than the Dentists Act, is the precedent which has been followed; that is to say, there will be a monopoly of the title of "registered architect," but no monopoly of practice; Parliament, therefore, has not needed to define the practice of architecture. On the other hand the Dentists Act, rather than the Medical Act, is followed in the provision which allows a right of appeal to the High Court to a person aggrieved by a decision to remove his name from the register or by temporary disqualification. Among other parallels or variations we may note that an architect's name may be removed from the register on conviction of a criminal offence or for "conduct disgraceful to him in his capacity as an architect." The traditional phrase "infamous conduct," sometimes a source of popular misunderstanding in relation to medical practitioners and dentists, has thus been dropped, and the language of the Veterinary Surgeons Act has been adopted instead. Such conduct in an architect will be referred to a disciplinary committee, which is assured of a legal element in its quasi-judicial functions because, in addition to members appointed by the Office of Works and the Ministry of Health, there are to be two members nominated by the President of the Law Society. The qualifications for registration include anyone who applies within two years, and satisfies the Architects' Registration Council that at the commencement of the Act—i.e., Jan. 1st next—he is or has been practising as an architect in the United Kingdom. There will thus be a class of "1931 architects," corresponding to the "1921 dentists."

The architects' profession is to be congratulated on obtaining this degree of statutory regulation. The establishment of a single central supervising body is valuable in itself. Much may be done even by a system of mere voluntary registration such as has been initiated lately, for instance, for biophysical assistants in the hope of ridding the public and the medical profession of quackery in certain physical treatments. Statutory sanction gives, of course, a national recognition as well as supporting the system of registration by the infliction of penalties for its abuse or infringement.

MOORFIELDS EYE HOSPITAL.—The annual report of the Royal London Ophthalmic Hospital, Moorfields, states that last year 2547 in-patients and 52,372 out-patients were treated, and that the income was £34,279 and the expenditure £32,480. The out-patients' department urgently needs enlargement; the cost will be £40,000, towards which £13,000 is available.

CORRESPONDENCE

IMPRISONMENT FOR MENTAL DISORDER.

To the Editor of THE LANCET.

SIR,—The letters of Prof. Millais Culpin (p. 373) and of Dr. Russell Brain (p. 426) raise an issue in which the National Council for Mental Hygiene is especially interested. The Council has in the course of the last few years collected records of a not inconsiderable number of cases in which the magistrates have refused to take into consideration the evidence of doctors as to abnormality in the mental condition of offenders, or have refused to permit examination by medical experts where this has been asked for in the interests of the offender. In addition to these there have been cases where the existence of an abnormality was undoubted and in which the magistrate has passed sentence without taking into consideration the medical aspect of the case. Three instances may be cited:

(1) A man of middle age had repeatedly written letters of an abusive nature to the municipal authorities accusing them of appropriating land which formed a part of his property. Medical evidence was adduced to show that the man was suffering from delusions of persecution. The magistrate sentenced the man to a term of imprisonment with the comment that "It was the function of the Court to cure delusions."

(2) A boy of about 17 years of age, described as of a moody and seclusive temperament and who had on several occasions previously behaved in a sufficiently bizarre manner to cause comment, set fire to some ricks. No motive was found and the boy was unable to give any reasonable explanation for his act. No investigation of the boy's mental state was made and he was duly sentenced.

(3) An educated woman of early middle age, a school teacher with an excellent record, was caught stealing some small articles in a store. No investigation was made into her mental condition although it was clearly established that she had no real need of the articles and could easily have paid for them. In passing sentence of imprisonment the magistrate said that although she was a woman of education and means she had yet behaved like a common thief, a fact which he considered an aggravation of the offence.

Comment on these cases is superfluous. On the other side of the picture and to show the value and importance of obtaining expert opinion the following cases which passed through my own hands may be cited:

(1) A married woman of early middle age, whose husband was of the respectable working class, was charged with writing abusive letters to certain public men making offensive allegations. Her previous record was blameless. The magistrate referred her for investigation to be made into her mental condition. It appeared that she was now at the menopause, and that for the last two years had been showing emotional instability and character changes during her periods, at times becoming definitely deluded, with ideas of persecution. She undertook to attend the hospital regularly for treatment and the case was dismissed. Needless to say there has been no recurrence of the offence.

(2) A boy, aged about 18, was charged with attacking a girl in a quiet street and trying to snatch her handbag. The boy's father, on his own initiative, brought him up to the hospital clinic before the trial for investigation into his mental condition. The boy had a perfectly satisfactory record at school and at home. He was, however, rather afraid of his parents and was latterly showing evidence of impaired memory and undue shyness and nervousness. His employment was uncongenial, and he was told to go and interview a new employer. Afraid to do this he loitered about, and forgetting where he had left his bicycle wandered out of the town. Towards evening he found he had no money and was some distance from home. He ascribed snatching the handbag to an unreasoning impulse. He finally returned home in a dazed condition and in great mental distress at what he had done. An uncle now offered the boy a post in the country. The girl did not wish to prosecute. A letter was written to the magistrates putting the medical factors of the case before them. The case was dismissed and the boy is now in the country and doing well.

At the biennial conference of the National Council for Mental Hygiene, held in May last, a general demand made itself felt for increased facilities for the education of magistrates on the subject of mental hygiene. The Council in its lecture courses held twice yearly always includes some aspect of this problem. The Tavistock Square Clinic for Functional Diseases has given lectures for magistrates and the National Council is arranging further lectures in the immediate future. One of the difficulties, however, is to procure the audience. Many magistrates, are busy people, and for those in the provinces especially it is difficult to afford adequate facilities, even if they were prepared to make use of them. The new Mental Treatment Act and the increase of out-patient clinics for the treatment and investigation of cases of emotional instability and early mental disorder should, however, in course of time provide a place to which doubtful cases can be referred in every area. It is important to educate the public as well as the magistrate up to the use of these invaluable facilities.

I am, Sir, yours faithfully,

DORIS M. ODLUM,

Hon. Sec. for Propaganda, National Council for Mental Hygiene.

August 23rd, 1931.

5

TUBERCULOSIS IN INFANTS.

To the Editor of THE LANCET.

SIR,—In your annotation of August 15th (p. 363) on Tuberculosis in Russian Infants, attention is drawn to the early appearance of this disease. It is often assumed in England that if a baby is breast-fed by an apparently healthy mother, tuberculosis need not be feared. Two cases recently encountered show that this may be a very erroneous idea, and that tuberculosis may be met in infants where there is no suggestion of the infection in either parent, or either family, nor any evidence of contact during the few weeks of life with any affected person. The conclusion to be drawn is that in some cases, even with no family history of tuberculosis, the susceptibility is very high, and massive infection is therefore unnecessary.

An entirely breast-fed infant, aged 43 days, weighing 7 lb. 1 oz. was admitted to Booth Hall Hospital for Children as a weakly infant with a history of having on the day of admission suddenly commenced to droop, the child having been perfectly well until then. Birth weight was 6 lb. 2 oz. When five weeks old the weight was 7 lb. 6 oz. and two days before admission 7 lb. 5 oz. The mother was admitted to feed the infant. There was slight vomiting on arrival, but no more until once 11 days later. There was no diarrhœa. A week later the child appeared hungry and lively, test feeds showing that he was obtaining about 5 oz.—a considerable amount for a seven weeks' baby. The next day one feed was refused, the general condition being poor. On succeeding days the temperature rose to 99° F., to 100°, and to 101°, dropping abruptly on the next day. X ray of the chest showed definite parenchymatous infiltration of both lungs, and the child was considered to be suffering from broncho-pneumonia. On the day the temperature fell the child had to be fed from a pipette with milk taken from the breast, and about 10 o'clock died quite suddenly. The Wassermann test was negative. Examination post mortem showed generalised miliary tuberculosis involving lungs, spleen, and liver, but not the brain.

In this case there was no direct evidence of parental infection; but the mother, during her pregnancy, drank unboiled milk from a source which is frequently found to be tuberculous. The mother was requested to return so that a sample of her breast milk might be examined for tubercle bacilli, but she failed to put in an appearance. Thanks to the kindness of Dr. D. P. Sutherland, senior tuberculosis officer for the City of Manchester, and Dr. Norah Smith who is in charge of the maternity and child welfare department, an extremely complete investigation was made into the previous history of this case as regards possible contact with a known case of tuberculosis, or the ingestion of any contaminated milk by the patient, with negative results.

Whilst interest was still aroused by this case, a similar one, as so frequently happens, came to my notice.

A child, aged 8 months, still on the breast, was admitted on account of gastritis and constipation. The combination is not usual, and progress was not satisfactory, there being continuous loss of weight. Vomiting and constipation persisted, and on the eleventh day after admission there was rigidity of the neck muscles, and an occasional squint, a note being made "the child does not appear dyspeptic; looks more like cerebral tumour." Examination of the eyes next day showed slight blurring of the nasal side of both discs, the vessels being normal. Lumbar puncture gave 20 c.cm., of clear colourless fluid under pressure, with no improvement in the condition. Examination of the cerebro-spinal fluid showed that the cells were increased to 29 lymphocytes per c.mm., the protein being 120 mg. per 100 c.cm., but no tubercle bacilli were found. Progress was now much more definitely suggestive of meningitis, and further lumbar puncture gave 65 lymphocytes per c.mm., protein 200 mg. per 100 c.cm., and tubercle bacilli were found. The child died on the nineteenth day, examination post mortem showing one caseous lobule and small discrete tubercular nodules in the lower lobe of the left lung, and hilar and bronchial glands enlarged, caseous, and softened. The brain showed evidence of tuberculous meningitis.

Investigation of the previous history of this case by Drs. Sutherland and Smith showed that the child had been breast-fed, but that after six months old it occasionally had crusts dipped in unboiled milk. This milk-supply has been found to contain tubercle bacilli several times, but on no occasion this year. The mother stated that she was in the habit of taking the child to the "pictures." The baby also had teething powders mixed with milk, but the child had not been in contact with any known case of tuberculosis, nor are the parents considered tuberculous. Here again though there was no family susceptibility, and though the infant was continually breast-fed, very slight exposure to infection was sufficient to give rise to a pulmonary infection which probably was the origin of the meningitis.

I am, Sir, yours faithfully,
J. D'EWART, M.B. Lond.,
Medical Superintendent, Booth Hall Hospital
August 25th, 1931. for Children, Manchester, E.

TOURNIQUET PARALYSIS.

To the Editor of THE LANCET.

SIR,—I wish to associate myself with the views expressed by Mr. N. L. Eckhoff in your issue of August 15th (p. 343). The advantages of a bloodless field are, as he says, so many, it is unnecessary to stress them. It is in the manner of procuring this that the difficulty lies. I have long realised that when I apply a tourniquet (a flat Martin's bandage) I am risking a paralysis, and recently, wherever possible, I have used a pneumatic tourniquet; but up to the present I have not been able to find a really satisfactory one. It slips off, or the valve leaks, or it takes up so much room that it encroaches on the field of operation; in some cases it is not long enough to encircle the limb, and then I have to discard it and continue the operation without, or disarrange everything while the Martin's bandage is applied.

There is not as a rule much difficulty with the upper limb; it is the lower limb which causes most of the trouble. Where the thigh is fat and short, and the operation is on the knee-joint, it is quite impossible to obtain a bloodless field with the pneumatic tourniquet in use—which is a canvas-covered affair, part of a sphygmometer outfit—and one is forced to use the Martin. But the efficient application of even this may be difficult under the circumstances described. Unfortunately my experience with regard to the lower limb has differed from that of Mr. Eckhoff, for I have had a case of paralysis of the peroneal nerve following the application of the "old thick rubber tube" just above the knee. I had to perform an open osteotomy of the upper third of the right tibia for a lady aged 29 who had severe bow legs. Two days later complete peroneal paralysis was discovered. As this did not clear up, I explored the nerve at the site of operation to see if it had been injured, but it was unhurt. The paralysis did not resolve completely for over six months.

One other point. I do not allow any one but myself to apply the tourniquet—keen and enthusiastic residents are apt to apply it too tightly.

I am, Sir, yours faithfully,
PAUL BERNARD ROTH.
Welbeck-street, W., August 24th, 1931.

A REVOLVING SOLARIUM.

To the Editor of THE LANCET.

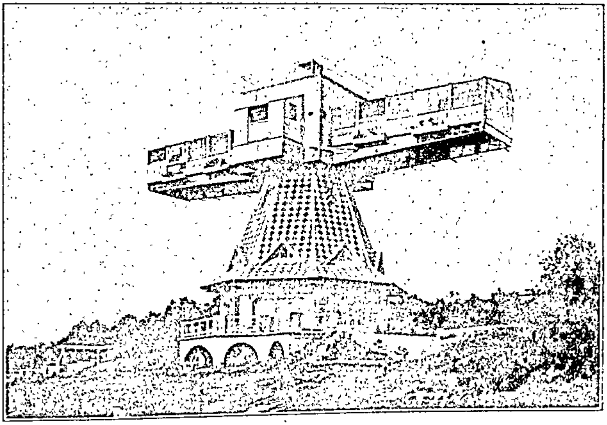
SIR,—The accompanying illustration (Fig. 1) shows a revolving solarium at Aix-les-Bains, France, which is, I am told, the only one of its kind in the world. The designer is Dr. Jean Saidman, director of the Institute of Actinotherapy in Paris, and I am indebted to him for kindly taking me over it.

Situated on a high hill amongst the mountains of Savoy, the solarium is visible a long way off and looks like an enormous aeroplane. On entering the door it seems incredible that such a network of machinery could have been constructed in so small a space. The ground floor consists of a miniature reception room, where the patients are indexed, and the solarium is kept in touch by telephone with the world below. In the middle of the body or tower is the lift, which brings one to the floor where the sun treatment is given. Apart from the reception office are the room of the director, where details of the patients' cases are filed, and here all the treatments are worked out and discussed by him and his able assistants, Dr. Robert and the electrotherapeutist, Mr. Sous. On the ground floor is also a waiting-room, which, like the other rooms, has silver wallpaper, glass doors, and silver chairs—everything to ensure light and brightness.

Proceeding to the top floor one has the sensation of being in the control tower of an aerodrome. In the middle of this floor is a small lounge, where the patients wait until they have their treatment; on the other side of that landing is the real heart of the whole mechanism, where the movements of the solarium are controlled so as to obtain the maximum intensity of the sun. The rays are measured by a special instrument, and the solarium is easily turned on its axis by an electromotor.

Dr. Saidman's method is based on three main principles, as follows: (1) The variations of the intensity of the constituents of sunlight (ultra-violet, visible, and infra-red) should be taken into account. (2) In ordinary sunlight treatment the patient lies flat on a couch and receives the rays obliquely; whereas in the solarium he is so placed that the rays fall perpendicularly on his body, and this immensely increases the amount of energy received from the rays. (3) Usually, sunlight treatment is prescribed without any previous measurement of the patient's tolerance; but here a test for the sensibility of the skin is done as a precaution.

FIG. 1.

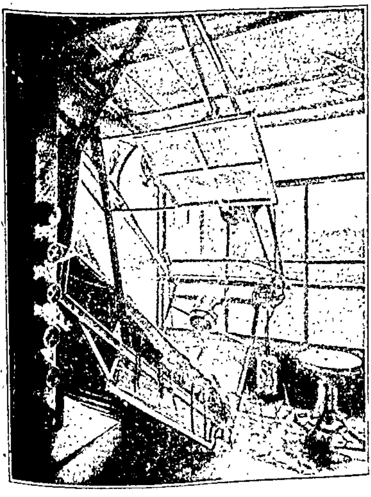


View of the solarium.

The treatment is given in the wings, which are composed of five rooms each. Each room or cabin, as shown in Fig. 2, has a couch which is tilted obliquely for the reasons already indicated. The sunrays are reflected on a special glass which concentrates them upon the patient. In one special cabin, however, it is possible to shut out all ordinary light and only ultra-violet rays are used.

While having treatment one has a magnificent view of the mountains, which naturally improves the therapeutic condition. Afterwards a cold douche is given, or a rub-down with eau-de-Cologne. Each cabin is in touch with the control room by telephone, and each amount of irradiation given to the individual patient shown on special meters. There is also a clock in each cabin, so that the time occupied in treatment is obvious at a glance. The risk of overdosage is much minimised by the preliminary "skin dosage sensibility test." On days when Nature does not supply sufficient sunlight, use is made of artificial sunlight by means of mercury-vapour lamps, of special pattern designed by the director of the solarium.

FIG. 2



Part of a treatment room.

Mostly during the treatment the patients drink the waters of the Source Saint Simon, which is one of the principal waters of Aix, and rises far away in the mountains. It is an alkaline water with diuretic action.

One floor lower than the cabins there is a very elaborate X ray plant generating 300,000 volts, which is used for deep X ray therapy; it has a very favourable effect on rheumatic affections of the joints. The patient is not in the same room as the X ray tubes, so there is no possibility of receiving electric shocks, and he is not made anxious. In order to achieve this he is placed on a special couch in the room below (on the ground floor) and his couch is pulled up to the ceiling. The rays are conducted to an opening in the ceiling, and the only thing the patient notices is the noise of the X ray plant above, which is not very great.

The solarium allows of all the applications of heliotherapy, but is primarily intended for the treatment of certain forms of rheumatism and arthritis. Neuralgias, cellulitis, and myositis are also benefited. The rays often reduce subcutaneous infiltrations and overcome muscular contracture. Synovitis and arthritis with fluid on the knees are also successfully treated in the solarium, and also old fractures, osteomyelitis, and recurring staphylococcal infections.

A visit to the solarium at Aix should be of great interest to those practising heliotherapy, for there is no doubt that with the principles adopted the best use can be made of sunlight treatment.

I am, Sir, yours faithfully,
HERMAN S. N. MENKO.

Northwick-terrace, N.W., August 8th, 1931.

ADMINISTRATION OF CALCIUM.

To the Editor of THE LANCET.

SIR,—In his note on Intramuscular Injections of Calcium in your issue of August 22nd Dr. Izod Bennett recommends the use of a solution of calcium gluconate and lævulinate. For some years past in cases which have needed calcium and where for any reason the intravenous route has been deemed inadvisable, I have used injections of calcium gluconate (Sandoz) intramuscularly. In several hundred injections which have been given I have had no case of necrosis. The dose I have commonly used has been 10 c.cm. of a 10 per cent. solution. I have often found it of value to combine this therapy with massive doses of calcium gluconate and lactose on an empty stomach; 1 drachm of calcium gluconate and 1 drachm of lactose in a suitable vehicle is of great value and there is no doubt, as many recent workers have shown, that lactose assists the absorption of calcium. I have not found the oral administration of calcium very helpful in the small doses which are often suggested. In cases of chilblains, urticaria, hay-fever, and even in the parkinsonism following encephalitis lethargica I have had good results by these methods. I believe—and I have had some radiological evidence to confirm this—that the small hard tablets of calcium preparations sometimes pass unaltered through the intestine.

I am, Sir, yours faithfully,

Harley-street, W., August 27th, 1931. GERALD SLOT.

FISSURES AT THE ANGLES OF THE MOUTH.

To the Editor of THE LANCET.

SIR,—In the excellent paper by Dr. Daniel T. Davies on simple achlorhydric anæmia, published in THE LANCET on August 22nd, mention is made of cracks and fissures at the angles of the mouth as occurring in this disease. I have noticed this physical sign for many years in patients suffering from all sorts of diseases, and sometimes none at all, who all had one thing in common—viz., large artificial dentures. And it is the daily taking out and putting in of these plates which cause and keep up the cracks, where this is done carelessly. After the patient has been advised to exercise great care in manipulating the plates so as not to overstretch the mouth, the cracks soon heal.

I am, Sir, yours faithfully,

Leeds, August 30th, 1931. HERBERT J. ROPER.

SYPHILIS AND YAWS.

To the Editor of THE LANCET.

SIR,—I have no wish to prolong this correspondence, but I should like to point out the microscopical differences between syphilis and yaws. These seem to me to settle the whole question. W. Fox (*Brit. Jour. Ven. Dis.*, 1928, iv., 68) came to the conclusion that the histology was a complete answer to Hutchinson. J. M. H. Macleod (*Brit. Med. Jour.*, Sept 21st, 1901; Practical Handbook of the Pathology of the Skin, London, p. 200) sets out these differences. In yaws the cellular infiltration is not clustered round the vessels, as in syphilis, and there are no multinuclear cells, giant cells, or intracellular hyaline degeneration as in yaws. So far as the fibrous stroma is concerned, rarefraction of collagen is more marked in yaws, and in that disease there is no organisation or colloid degeneration such as occurs in gummata. The vessels in yaws show no proliferative changes in walls and endothelium as do those in syphilis. In yaws there is a marked proliferation and downgrowth of epithelium with great thickening of the horny layer, such as does not occur in syphilis.

I am, Sir, yours faithfully,

Municipal Clinic, Salford. E. TYTLER BURKE.

THE SERVICES

ROYAL NAVAL MEDICAL SERVICE.

Surg. Lts. A. D. Sinclair to *Centurion*; R. M. B. Lowis to *Moth*; and J. W. L. Crosfill to *Fowey*.

ROYAL NAVAL VOLUNTEER RESERVE.

Surg. Lt.-Commr. H. Winstanley to *Victory* for Haslar Hospital.

Proby. Surg. Lts. J. F. Heggie and F. T. Land to *Victory* for Haslar Hospital; G. E. W. W. Bayly, entered as Proby. Lt., and attached to List 1, Severn Divn., outlying unit at Newport.

Proby. Surg. Sub-Lt. B. R. Alderson to *Pembroke*, for R.N. Barracks.

Surg. Sub-Lt. A. P. Trimble to be Surg. Lt.

Surg. Sub-Lt. J. C. Moor to be Surg. Lt.

ROYAL ARMY MEDICAL CORPS.

ARMY RESERVE OF OFFICERS.

Lt.-Col. N. D. Walker has attained age limit; Capt. A. L. Taylor, from Supp. Res. of Off., to be Capt.

R. L. H. Minchin to be Lt.

ARMY DENTAL CORPS.

Lt. A. F. D. Shapland resigns his commn.

TERRITORIAL ARMY.

Edward Davies-Thomas to be Lt.

INDIAN MEDICAL SERVICE.

Lt. J. H. Boultbee to be Capt. (prov.).

The promotion of Maj. R. A. Warters is antedated to July 12th, 1927.

The undermentioned officers retire: Lt.-Col. A. G. Tresidder and Maj. R. R. M. Porter, on account of ill-health.

A SOUTH-WESTERN CRIPPLES' TRAINING CENTRE.—Under the auspices of the Plymouth and district cripples' aid committee it is proposed to open in Devonshire a training college for cripples to serve the whole of the south-western counties. At the end of March there were 567 cases under the care of the committee.

FINANCES OF THE BIRMINGHAM HOSPITALS.—An appeal is shortly to be launched for £90,000 on behalf of the General Hospital (£50,000), the Queen's (£30,000), and the Ear and Throat (£10,000). The Maternity Hospital has already made an appeal for £15,000, and the Skin and Urinary Hospital will in the near future ask for the means of increasing the number of its beds from 22 to 50; the Children's Hospital is likewise contemplating an appeal. The General Hospital will have an overdraft of £40,000 by the end of September, and the bank is asking for its reduction, £25,000 of it being unsecured. The number of beds for paying patients is about to be doubled. The Queen's has an unsecured overdraft of £22,000, and all its free investments have been sold to meet the additional maintenance cost of the new surgical block of 120 beds. Last year the Ear and Throat Hospital spent £3303 in excess of its income, £2000 worth of investments have been sold this year, and there is still an overdraft of £3500. The city's hospitals now contain a total of 1734 beds; in 1930 there were 28,825 new in-patients and 190,467 new out-patients. Meanwhile the Lord Mayor, as President, with other officials of the Birmingham Hospital Saturday Fund, which forms an integral part of the contributory scheme, has issued a circular setting out the case for raising the weekly contributions of members from *2d.* to *3d.* It is pointed out that although this fund is the most successful in the world it is inadequate and not self-supporting, and that the contributory patients are costing the hospitals many thousands a year more than they are paying for their treatment. The proposal has been considered by the board of delegates of the Saturday Fund.

PUBLIC HEALTH SERVICES

ANNUAL REPORTS OF MEDICAL OFFICERS OF HEALTH.

THE following are 1930 statistics of three counties :—

Name of district and estimated mid-year population.	Birth-rate.	Death-rates per 1000 of the population.					Death-rates per 1000 births.		
		All causes.	Tuberculosis.	Cancer.	Respiratory diseases with influenza.	Heart disease.	Infant mortality.	Young child (1–5 yr.) mortality.	Maternal mortality from childbirth.
Derbyshire .. (624,300)*	16·9	10·1	0·59	1·12	1·3	1·9	61	—	4·1
Surrey .. .. (861,850)*	15·2	10·0	0·62	1·52	1·0	2·1	41	15	3·4
Hampshire .. (432,600)*	16·5	11·3	0·70	1·62	1·1	2·5	44	20	3·8

Registered stillbirths per 100 live births: Derbyshire, 4·6, Surrey, 3·3; Hampshire, 3·3.

* The 1929 populations have been used.

Derbyshire.

Dr. W. M. Ash describes how the new duties of vaccination, infant life protection, and the maintenance of institutions for the physically and mentally sick, placed on the county council by the Local Government Act, 1929, are being dealt with. There are 10 vaccination officers and 81 public vaccinators and the contracts with them have been renewed excepting for the portions of their districts which are without the county boundary. The duty of supervising infants under 7 years of age who are received for reward has been met by appointing the county health visitors as infant life protection visitors. These children numbered 80 at the end of the year. Since the work was transferred from the guardians, parents have been requested, in four cases, to find more suitable foster-parents and in one case a child has been removed from unsuitable guardians by order. The maternity and child welfare committee also supervises the children boarded out by the public assistance committee. It has not been possible for the health committee to take over any of the poor-law hospitals, seeing that only two "institutions" permit of efficient separation of the hospital from the "house," and that there is no superfluity of beds which would allow the institutions to be closed for poor-law purposes. The health committee has not yet consulted the representatives of the voluntary hospitals with a view to formulation of a complete scheme. There has been no important change in the administration of out-relief since the transfer, but all assistance since April 1st has been given to the blind under the Act of 1920. Dr. Ash shows in this, as in previous reports, how an efficient and adequate general hospital system can be built up for the county and he hopes that two hospital services, voluntary and municipal respectively, will not be set up unless they are run in close coöperation and avoid unnecessary competition. He advocates one comprehensive institution for each area as a centre for preventive and curative medicine. The public assistance institutions are not, he says, suitable for the accommodation of many young and middle-aged people suffering from chronic disease and new provision is required for such.

The county mental hospital at Mickleover in 24 wards has accommodation for 388 males and females, and during the year a new up-to- admission block for 100 patients has been opened, which is claimed to be one of the most complete buildings of this type. The county council has no mental deficiency institution and this is a pressing need. At the end of 1930 there were 30 male and 115 female mental defectives accommodated in certified institutions outside the county. The county council scheme for dealing with the 15 isolation hospitals proposes to diminish their number and to have three isolation hospital areas. The formulated principles of the scheme appeared to be generally acceptable to the local authorities, but when it came to deciding as to which hospitals should be closed it was immediately apparent that most of the local authorities qualified their acceptance of the scheme by a proviso that their own particular hospital should not be closed. Dr. Ash points out that the present isolation hospital system does not cover the whole county, does not attract an efficient staff, and does not uniformly adopt immunisation methods against diphtheria and scarlet fever. Further it provides, as a rule, for diphtheria and scarlet fever only save, sometimes, for typhoid fever. There is no provision for the proper nursing of measles and no accommodation for cerebro-spinal fever, encephalitis, dysentery, or poliomyelitis. The provision for small-pox Dr. Ash describes as lamentable, as many of the small-pox hospitals are not reasonably fit for human habitation. He wishes to see a small and a large hospital unit established in each of the three isolation hospital areas for dealing with small-pox. Occasional cases would be dealt with at the small unit and the larger units would be used for other county purposes during inter-epidemic periods. The accommodation for tuberculosis patients was improved during the year by the opening of a new 32-bed pavilion for adults of both sexes suffering from surgical tuberculosis. There is a lack of beds for advanced pulmonary cases, and Dr. Ash suggests that when the isolation hospital service is reorganised the small isolation hospitals, which are closed, could be readily adapted for observation and advanced cases of pulmonary tuberculosis and equipped with modern X ray apparatus. In this manner the needed additional beds for advanced and observation cases could be provided in situations accessible to relatives whilst freeing the sanatorium from the type of case which should not be there.

The county council has two maternity homes and contracts for the use of beds at four others. Each of the eight public assistance institutions also provides maternity beds but frequently in a very wasteful manner. For example, the county maternity home at Ashbourne is by no means fully used but the county council provides a maternity ward at its Ashbourne public assistance institution to which only one case was admitted during the year. A similar state of affairs exists at Chesterfield. The county council contracts for admission of both mother and child to the Royal Infirmary, Derby, in cases of ophthalmia neonatorum. During the year 65 cases were notified, of which 51 were treated at home and 14 in hospital. Vision was impaired in two cases. The antenatal scheme conducted by Miss E. E. Stephens, M.D., at 12 clinics throughout the county has grown rapidly since its inauguration in 1928. The attendances numbered 3117, as compared with 2316 in the previous year. During the year a child guidance clinic was opened at Matlock and is conducted by a member of the medical staff who has had special experience. Children are seen by appointment only.

Of 457 samples of sewage effluents 201 were classified as good, 110 as satisfactory, 48 as unsatisfactory, and 20 as bad. The county council has laid down a standard for the production of clean milk and 1930 the two county sanitary inspectors number of cowsheds with the ers and gave advice, which ies for the clean milk increase and the inspecting judge reported very favourably on the high standard of efficiency attained.

Surrey.

Dr. J. Ferguson says that before April 1st, 1930, there had been in Surrey for 100 years the whole or large portions of 12 poor-law unions, and that the former boards of guardians interpreted the term "destitute" in a wide sense. The county council is anxious to transfer the care of the sick to the public health committee, of the mentally deficient to the mental hospitals committee, and the education of children to the education committee; and the public assistance committee is endeavouring to overcome the difficulties arising from the fact that few of the former hospitals are administered separately from the rest of the institution. The county council has, however, decided to appropriate the Chertsey and Bletchingly institutions for the care of mental defectives. There are in all 10 institutions with 1918 beds and the largest hospital, that of Kingston and district (547) beds) is that which can be most easily adapted for separate use and transferred to the health committee. Towards the end of 1929 the Surrey voluntary hospitals consultative committee, consisting of 24 members representing the governing bodies and medical staffs of the voluntary hospitals, was constituted. At its meetings this committee has made valuable constructive criticisms of the proposals placed before it by the county council. The voluntary hospitals have 1277 beds, the isolation hospitals 633, and the mental hospitals 2507. As regards medical out-relief there has been no change in the policy pursued by the former boards of guardians.

The county health visitors have been approved as infant life protection visitors. On April 1st there were 214 foster mothers who received 304 children, and at the end of the year 406 foster-mothers had given notice in respect of 501 children. The boroughs of Guildford and Wimbledon applied to the Ministry and were appointed local supervising authorities under the Midwives Acts, but a similar application by four urban district councils was not approved. In 1929 a whole-time woman medical officer with special experience in midwifery, &c., was appointed to undertake antenatal work and, at the 15 special clinics throughout the county conducted by her, 977 women attended antenatally and 132 postnatally. The Surrey Council has contracted with the L.C.C. for the institutional treatment of ophthalmia neonatorum. Notifications numbered 46. The cases in the practice of midwives numbered 26, of which 22 were treated at home and 4 in hospital. There were two deaths and vision was unimpaired in the remainder. The result in the 20 cases which occurred in the practice of doctors is not given.

The county council is making arrangements to obtain particulars of the housing situation from the rural districts. On the basis of four persons per house new provision was made for housing 44,000 persons and provision for 22,056 was in hand at the end of the year, but 1436 completed houses and 1288 in course of construction are L.C.C. houses to accommodate residents in the County of London. Mr. F. W. Medlock, M.R.C.V.S., and his four assistants have carried out a quarterly inspection of the herds of the Surrey cowkeepers. The cow examined numbered 67,443, of which 59,415 were in milk. The number of animals dealt with under the Tuberculosis Order was 142, 41 of which were reported to the police as suspect and 101 of which were detected by routine inspection. At the end of 1930 the river Wandle improvement works were practically completed.

In addition to participating in the London V.D. scheme the Surrey Council has clinics at Guildford and Redhill, at both of which the attendances increase. An additional session became necessary at Guildford where there is an ad hoc clinic in the hospital grounds. It is hoped soon to have a third clinic at Kingston and District Hospital. The 14 isolation hospitals have been surveyed and a scheme for the provision of adequate accommodation for the county is in course of preparation. For small-pox the Whitmoor Hospital (10 beds) makes provision for Godalming, Woking, and the urban and rural districts of Guildford, whilst the Clandon Hospital (37 beds) provides for Croydon and the rest of the county. During 1930, 40 cases were admitted to Clandon and the hospital was only closed for eight days during the year. Two of the cases were laundresses infected in the course of their duties. In May to July there was a considerable outbreak of paratyphoid in Barnes—49 cases, of which 16 were males and 33 females. Children and young persons were specially attacked. Fifteen of the patients were severely ill but there were no deaths. The cases were widely distributed over the area and no definite cause for the outbreak was discovered.

Hampshire.

Dr. H. Leslie Cronk reports that up to the end of 1929 grants of £13,761 and loans of £1148 had been paid on 156 cottages under the Housing (Rural Workers) Act, 1926, and that all but six of the 22 rural districts had made applications. Up to the end of 1930 grants totalled £23,231 and loans £2870 with respect to 297 cottages, showing that the Act was more used in 1930 than in any previous year. The extension of the Act and the further provision of £7000 for loans and grants by the county council in February, 1931, will allow further use to be made of this Act, which, says Dr. Cronk, alone enables the preservation of old cottages, that are picturesque assets to the county and can be let at a lesser rental than any new cottage. Under the Housing Act of 1930 a questionaire was issued by the housing subcommittee to obtain information with regard to the housing position in the 22 rural districts. This was followed by a conference in February, 1931, at which 19 of the rural district councils were represented. Exact information was not forthcoming as to how many of the 4087 subsidised houses erected since 1926 were for the agricultural population. Dr. Cronk thinks the problems for the rural districts are provision for housing shortage and the renovation of unfit houses, and that the latter problem can best be dealt with under the Housing (Rural Workers) Act. For any scheme to relieve shortage the county council would have to be satisfied that the houses were needed for the agricultural population.

The accommodation available for the sick in public assistance institutions and the best means of coöperation with the voluntary hospitals are now under consideration. Particulars of the 16 isolation hospitals in the county are given, but nothing can be done in the matter of eliminating unsatisfactory small hospitals and the concentration of beds in as few centres as possible until extensive alterations in the local sanitary areas have been arranged. Small-pox is accommodated at Winchester and at Basingstoke, and plans have been prepared for the improvement of the Winchester hospital.

During 1930 there were 18 antenatal clinics at work which were attended by 412 expectant mothers. In January, 1931, 31 antenatal clinics were established and on May 31st there were 34 in operation, 10 staffed by an assistant county medical officer, and 24 by practitioners of the neighbourhood with special experience. The new cases during the first quarter of 1931 were 382, as compared with 412 during the whole of 1930. Transit is frequently a difficulty for the women and the county council has agreed to pay the fees of general practitioners for domiciliary antenatal visits in such cases. Expectant mothers found antenatally to require dental treatment are treated by the council's dental surgeons. Of 107 mothers needing treatment 97 were actually treated during 1930. The premium to be paid by expectant mothers to ensure against the cost of medical attendance has been raised from 5*s.* to 7*s.* 6*d.* in first pregnancies, but in spite of this the number of insurances has increased. During 1930, 3079 midwives' cases insured and to them a doctor was summoned in 40 per cent. at a net cost to the council of 5*s.* 2*d.*

per case; whilst there were 2336 uninsured midwives' cases, to which the doctor was called on 833 occasions at a net cost to the council of 5*s.* 8*d.* The changes in the reasons for summoning medical aid, says Dr. Cronk, show that more attention is being paid by midwives to the necessity for calling in the doctor for complications which really matter. In the 19 public assistance institutions for which the county council is responsible, 47 beds are allocated for maternity cases, but only 102 births took place in these institutions during the year. The council's health visitors took over infant life protection work on April 1st. It was found necessary to withdraw approval from four foster-mothers formerly supervised by the guardians and from two foster-mothers notified after April 1st. Of 14 applications to receive foster-children two had to be refused as unsuitable.

The fifth county clean milk competition attracted a largely increased number of competitors. A new system has been introduced by which those who have attained the required standard in previous competitions are excluded from competing but become eligible for a Register of Accredited Milk Producers. Of the number eligible, 34 decided to register and both surprise and routine samples will be taken of their milk to ensure that they continue to practise what they have learned in the competitions. There is no routine inspection of the herds, and for checking the sale of tuberculous milk reliance is placed on notification by the owner, on outside complaints of tuberculous milk, on reports of tuberculous carcasses from the county slaughter-houses, and on the biological examination of 800 samples of milk supplied by the district councils. These methods resulted in 43 cows being dealt with under the Order.

INFECTIOUS DISEASE

IN ENGLAND AND WALES DURING THE WEEK ENDED AUGUST 22ND, 1931.

Notifications.—The following cases of infectious disease were notified during the week:—Small-pox, 21 (last week, 19); scarlet fever, 1200: diphtheria, 652; enteric fever, 52; pneumonia, 393; puerperal fever, 39; puerperal pyrexia, 136; cerebrospinal fever, 20; acute poliomyelitis, 8; acute polio-encephalitis, 2; encephalitis lethargica, 10; dysentery, 5; ophthalmia neonatorum, 110. No case of cholera, plague, or typhus fever was notified during the week.

The number of cases in the Infectious Hospitals of the London County Council on August 25th-26th was as follows: Small-pox, 27 under treatment (last week 35 under treatment, 2 under observation); scarlet fever, 1087; diphtheria, 1368; enteric fever, 18; measles, 134; whooping-cough, 362; puerperal fever, 22 (plus 14 babies); encephalitis lethargica, 211; poliomyelitis, 7; "other diseases," 106. At St. Margaret's Hospital there were 12 babies (plus 5 mothers) with ophthalmia neonatorum.

Deaths.—In the aggregate of great towns, including London, there was no death from small-pox, 4 (1) from enteric fever, 13 (0) from measles, 3 (1) from scarlet fever, 11 (3) from whooping-cough, 18 (0) from diphtheria, 37 (6) from diarrhœa and enteritis under two years, and 17 (1) from influenza. The figures in parentheses are those for London itself.

The fatal cases of enteric fever outside London occurred, two at Portsmouth and one at Nottingham. Three deaths from measles were reported from Leeds, two from Bradford. Hull reported four deaths from diphtheria. Diarrhœa was credited with eight deaths at Liverpool, four at Birmingham, and three at Newcastle-on-Tyne.

The number of stillbirths notified during the week was 315 (corresponding to a rate of 46 per 1000 births), including 52 in London.

ENLARGEMENT OF DUDLEY GUEST HOSPITAL. The nurses' home of this institution is to be enlarged immediately to accommodate 20 additional nurses. A further 28 beds will then be available, bringing the total to 135.

MEDICAL NEWS

Royal College of Physicians of Edinburgh.

On the occasion of the 250th anniversary of the College it has been decided to confer the honorary Fellowship on Sir David Bruce, Lord Dawson of Penn, Sir Archibald Garrod, Sir William Hale-White, Dr. Robert Hutchison, Sir Thomas Lewis, Sir Donald MacAlister, Sir Edward Sharpey-Schafer, Sir Charles Scott Sherrington, Dr. Charles Achard (Paris), Dr. Frederick Grant Banting (Toronto), Dr. A. A. Hijmans van den Bergh (Utrecht), Dr. Knud Faber (Copenhagen), Dr. George Richards Minot (Boston, U.S.A.), Dr. Friedrich von Müller (Munich), Dr. Hermann Sahli (Berne), Dr. William Sydney Thayer (Baltimore), and Dr. Julius Wagner-Jauregg (Vienna).

Medical Society of London.

The programme for the first half of the 159th session opens with the annual general meeting at 8 P.M. on Monday, Oct. 12th, after which at 8.30 P.M. Mr. Herbert Tilley will give his presidential address on the Laryngoscope in Medicine. Subjects for the fortnightly Monday evening discussions are as follows: Oct. 26th, Blood Transfusion, to be introduced by Prof. Alex. Fleming, Dr. H. L. Tidy, and Mr. Geoffrey Keynes. Nov. 23rd, Methods of Determining Liver Function and Their Value, to be introduced by Sir Humphry Rolleston and Prof. E. C. Dodds. Dec. 14th, X Rays in the Diagnosis of Thoracic Disease, to be introduced by Dr. P. J. Kerley, Dr. F. G. Chandler, and Mr. J. E. H. Roberts. All these discussions begin at 8.30 P.M. The clinical evening on Nov. 9th begins at 8 P.M.

Epsom College.

A vacancy has arisen for a Salomons entrance scholarship of £50 a year. Candidates must be sons of legally qualified members of the medical profession either living or deceased, and must have been over 11 and under 14 years of age on Jan. 1st last. They must show an adequate standard of education for their age, and their financial condition must be such as to make it impossible to obtain an education at the College without the help of the scholarship. Applications, in proper form, must reach the Secretary at 40 Bedford-square, London, W.C.1, by the morning of Sept. 30th.

Instruction for D.P.H.

A three months' course of lectures and demonstrations on clinical practice and in hospital administration will be given at the North-Western Hospital, Lawn-road, Hampstead, N.W.3, by Dr. Alexander Joe, the medical superintendent, on Mondays and Wednesdays at 3.30 P.M. and alternate Saturdays at 11 A.M., beginning on Wednesday, Sept. 30th. Application should be made to the Medical Officer of Health, London County Council, Public Health Department (Special Hospitals), Victoria Embankment, E.C.4.

Middlesex Hospital Medical School.

The ninety-seventh winter session will open on Thursday, Oct. 1st, at 3 P.M., in the Queen's Hall, Langham-place, London, W., when Prof. James McIntosh will deliver the introductory address and Sir John Bland-Sutton will distribute prizes gained during the previous year. At 7.30 P.M. on the same day the annual dinner will be held at the Savoy Hotel.

National Smoke Abatement Society.

The third annual conference of this society will meet at Liverpool from Sept. 18th to 20th, under the presidency of Dr. H. A. Des Voeux. Among the speakers will be Dr. J. Johnstone Jervis and Dr. James Bennett.

Fellowship of Medicine and Post-Graduate Medical Association.

There will be six special courses in September at the following institutions:—(1) Hospital for Consumption and Diseases of the Chest, Brompton, from Sept. 7th to 12th, all day. (2) Bethlem Royal Hospital, Monks Orchard, Eden Park, Beckenham, from Sept. 8th to Oct. 3rd, on Tuesdays and Saturdays at 11 A.M.; lecture-demonstrations in psychological medicine. (3) Infants Hospital, Vincent-square, from Sept. 14th to 26th, from 2 P.M. daily, with special visits in addition; course in diseases of infants. (4) Central London Ophthalmic Hospital, Judd-street, from Sept. 15th to Oct. 8th, each afternoon; lecture-demonstrations in ophthalmology. (5) Westminster Hospital, from Sept. 14th to 26th, all day; course in general medicine and surgery, for men only. (6) Metropolitan Hospital, Kingsland-road, from Sept. 28th to Oct. 10th, all day; course in general medicine and surgery. Copies of all syllabuses may be had from the Fellowship at 1, Wimpole-street, London, W. 1.

towns the burgh prosecutor can investigate fire outbreaks if requested by the town council or on special report by the firemaster that wilful fire-raising is suspected. As matters thus stand, the Royal Commission's recommendations are an obstacle to the extension of the City of London practice. Indeed the ancient usefulness of the coroner as an investigator of crime is latterly somewhat belittled. Section 20 of the Coroners (Amendment) Act of 1926, which put the coroner out of action when once the examining justices have taken in hand proceedings in cases of suspected homicide, was a serious break with the past.

BRITISH DERMATOLOGY.

To the "Annals of Medical History" (Vol. III., New Series, July, 1931), Dr. Haldin-Davis contributes an article of real historic interest setting out the foundations of British dermatology, from which we learn how comparatively modern is anything like rational treatment of skin diseases. From the very dawn of medicine affections of the skin must have received attention from doctors, for the sufferers from skin diseases are more urgent than any class of patients in their demands for relief, while it is a lamentable fact that a substantial proportion of them can only be offered remedial measures of a partial or temporary character. But there is hopefulness in the fact that with the general development of pathology more and more dermatological defaults, following upon the discovery of their origin, are yielding to intelligent therapeutics. Dr. Haldin-Davis attributes the progress of the last century mainly to the publication of Robert Willan's treatise in 1808. This was an attempt at the rational classification of skin diseases based upon characteristic lesions, and the author completed half of the projected work during his life-time. His pupil, Thomas Bateman, completed the treatise which was published under the heading "A Practical Synopsis of Cutaneous Diseases, according to the Arrangement of Dr. Willan." The basis thus introduced into dermatological classification has largely remained; where possible the scientific procedure of classifying by ætiology has replaced Willan's classification by appearances; but, as Dr. Haldin-Davis points out, our knowledge of the ætiology of skin diseases is lamentably deficient at the present day, except in the case of a few infective agencies, compelling us largely to classify skin diseases according to their appearances. Reading this article it becomes clear that Willan was a very remarkable man, for without the microscopic aid by which so many advances in this field of medicine have been made, he devised a system of classification 130 years ago which to-day is the main medium for intelligent converse between experts.

BLOOD PRESSURE IN THE CAPILLARIES.

RESEARCH which produces important results is of obvious value, but just as useful is the work which repeats research in order to confirm or disprove it. This checking of results will often prevent a whole crop of errors.

For a long time attempts have been made to measure the pressure in the capillaries. Many different methods have been applied, but so far no satisfactory solution of the problem has been found. Recently A. Sokolowski and M. Kubiczek [1] have undertaken investigations into the method designed by Kylin—a method of compression, which has hitherto been accepted as giving the most accurate data. They approached the problem from two aspects, considering first the technical difficulties arising from imperfections in the apparatus, and secondly, the results as interpreted in the light of the anatomy and histology of the part investigated. The imperfections in the apparatus, they found, made comparative study impossible and by certain modifications they tried to overcome them. Then they succeeded in making several interesting observations. For example, they noted that after the initial compression the capillary loops continued to contract despite a rapid diminution in the pressure. This suggested an active contraction on the part of the vessels as a result of irritation of the vasomotor nerve-endings in the vessel walls; consequently, any results obtain with this apparatus would be influenced in great part by the vasomotor nerves. Again, when an attempt was made to get repeated readings for comparative study—as, for example, when testing the effects of certain drugs—it was found that after each compression a strong vascular hyperæmia ensued, necessitating a pause of four to six minutes between each reading.

The second half of the work consisted of a careful examination of the anatomy and minute histology of the part which had been investigated—namely, the skin just behind the nail bed. Sections of various thicknesses were taken and stained by several methods. Correlating the results, they came to the conclusion that readings obtained by Kylin's method of compression, and, in fact, all compression methods, did not give the pressure in the capillaries, but gave actually the pressure in the afferent arterioles; in the area under examination the arteriole was the one described by and named after Spalteholz. Again, the results were influenced by the thickness of the skin of the subject investigated, and by several other factors.

The main result from these investigations is to show the innumerable difficulties in the way of any attempt to measure capillary pressure, and the inaccuracies of an accepted method.

ANÆMIA IN PREMATURE BABIES.

As a further supplement to the work of Dr. Helen Mackay [1] comes the report of some investigations by Dr. G. Sanpaolesi,[2] of Florence, carried out in Prof. Czerny's clinic in Berlin. He examined the blood of twelve premature babies at approximately weekly intervals, beginning from two days to three months after birth. He enumerated the total red blood corpuscles present, estimated the amount of hæmoglobin, and calculated the water content by the indirect method of determining the total solids. All the babies were born normally, ten were one month premature and two were two months premature. In one case congenital heart disease was present and another suffered from a congenital syphilitic infection. Otherwise the children were normal and developed normally except for slight digestive troubles which were without influence on the weight curve. None of the children showed evidence of the so-called exudative diathesis, held by some authorities to be the cause of the hydræmia from which they all appeared to suffer in the third month of life. In the first four weeks Sanpaolesi found normal values for total solids and water content of the blood but in the second month began a decrease in the solids and increase in the water content, associated with a parallel decrease in the number of red blood corpuscles and amount of hæmoglobin present. This was not accompanied by any alteration in the weight curves and in the child with congenital syphilis the decrease in total solids was more marked than in the normal babies, while the patient with congenital heart disease had only a minimum decrease. In two cases where vegetable additions to the diet were early introduced the decrease in total solids was very slight and there was a correspondingly quick recovery after the third month, although no influence of the diet on the total red cell count and hæmoglobin content could be detected. Sanpaolesi thinks that iron deficiency is not of great importance in the anæmia of the premature baby which seems to be due rather to a disturbance of the water-regulating mechanism of the body. Further observations on the total blood volume are necessary to settle this point and they present great practical difficulty. For the moment he merely draws the conclusion that there is certainly a dilution of the blood in the third month of life in premature babies and that this plays a part in producing what may be called the physiological anæmia of prematurity.

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[1] Ann. de Méd., 1931, xxix., 408.

[1] See THE LANCET, July 25th, p. 195.

[2] Jahrb. f. Kinderh., 1931, cxxxii., 277.

ADDRESSES AND ORIGINAL ARTICLES

PRECANCEROUS LESIONS OF THE ALIMENTARY TRACT.*

By Matthew J. Stewart, M.B. Glasg.,
F.R.C.P. Lond.,
PROFESSOR OF PATHOLOGY IN THE UNIVERSITY OF LEEDS.

LECTURE I.

In choosing as the subject of these lectures the precancerous lesions of the alimentary tract I had in mind two main considerations, one that it includes within its scope a number of pathological states for the study of which I could reasonably claim to have had exceptional opportunities; the other that it deals with matters of prime importance in medicine. The field is a big one, and I propose to concentrate on those aspects with which I am personally more familiar, and to make but passing reference to others of which I have had little or no experience. Of the importance of the subject it is hardly necessary to speak: the Registrar-General's statistical review for the year 1929 is sufficient demonstration. In that year there were 56,896 deaths from cancer in England and Wales, of which at least 60 per cent. in men and 42 per cent. in women were referable to the alimentary tract.

At the present time it is probably true to say that the most hopeful side of cancer research is that concerned with the demonstration of local causative factors, and the recognition and prevention of precancerous lesions of one kind or another. Unfortunately it is to the more superficial forms of malignant disease, a very small fraction of the whole, that this principally applies; precancerous lesions of the alimentary tract are by no means so well established, nor are there the same opportunities for prophylaxis.

The following is a rough attempt at classifying the chief precancerous lesions (or alleged precancerous lesions) of the various portions of the alimentary tract, and indicates also the order in which I propose to deal with them.

(a) Chronic inflammatory lesions: (1) leucoplakia; (2) lesions due to burns and chemical caustics; (3) cirrhosis of the liver; (4) hæmochromatosis; (5) cholelithiasis and cholecystitis; (6) chronic gastric ulcer; (7) chronic gastritis; (8) chronic duodenal ulcer; (9) diverticulitis.

(b) Simple tumours as precursors of cancer.

(c) Lesions due to animal parasites.

Leucoplakia.

The squamous epithelial lining of the mouth, pharynx and œsophagus, vulva, vagina and vaginal portion of the cervix, and part of the larynx, differs from the ordinary surface epithelium of the body in that it fails to form a definite stratum corneum, the effete surface cells being removed at an earlier stage of their development. In the so-called transitional epithelium of the urinary tract not only is there no keratinous layer, but even the stratum granulosum and stratum lucidum are lacking. In certain conditions of chronic irritation all this is changed, and patches of fully developed, highly keratinous epithelium make their appearance in the situations mentioned. The affected areas are white and opaque, stiff and unyielding, and in consequence liable to become cracked, fissured, and ulcerated. In leucoplakia vulvæ a special feature is the formation in the more advanced stages of a broad hyaline zone of dense collagenous deposit in the immediately subepithelial layer, accompanied by thinning and atrophy of the epithelium, complete or almost complete disappearance of the papillæ, and flattening out of the labia minora. In the tongue there is also an underlying chronic inflammatory lesion of the subepithelial layer which goes on to cicatricial fibrosis, but the broad, semitranslucent collagenous zone is not formed.

The distribution of leucoplakia is irregular and often asymmetrical. In the buccal cavity, much the commonest site, it affects chiefly the tongue, especially the anterior half of the dorsum and the margins, the commissures and cheeks, occasionally the lips, soft palate, and gums. The frequency of involvement of these sites in a series of 40 cases was found by Fox (1925) to be as follows: tongue, 28; commissures, 26; cheeks, 21; lips, 9; soft palate, 2; gums, 0. In the œsophagus it is seen first and chiefly in the lowest two or three inches, but may be widespread throughout the tube. The vulval lesion, not very uncommon, affects mainly the labia minora, but may extend on to the labia majora, perineum and thighs, and even encircle the anus. In the urinary tract, a much less frequent site, the bladder is the organ chiefly affected, the renal pelvis less than half as often, and the ureter and urethra only rarely. The combined figures of Hennessey (1927)—80 cases collected from the literature—and Kretschmer (1928)—13 new cases—are as follows: bladder, 49; bladder and ureter, 2; renal pelvis, 26; pelvis and ureter, 6; bladder, pelvis, and ureter, 3; ureter, 1; urethra, 3; not stated, 3; total, 93. Leucoplakia of the portio vaginalis cervicis is generally regarded as a rare disease, although Hinselmann, in a series of papers (*Cancer Review*, 1929, iv., 305) expresses the view that it is of frequent occurrence if only it is looked for.

ÆTIOLOGY.

This is different for different sites. In the mouth the chief cause is syphilis. Lane-Claypon (1930) found that in a collected series of 649 cases where the necessary information was available, 427, or 65·8 per cent., were definitely syphilitic. The lesion is a late one and is not amenable to antisyphilitic treatment. In the remaining cases, roughly one-third, other causes are at work, some of which are also additional factors in the syphilitic group, especially heavy smoking and more or less heavy drinking. Leloir (quoted by Lane-Claypon) gives details of the habits of 35 patients whom he investigated: 33 were heavy smokers and 27 more or less heavy drinkers. In this connexion attention is drawn to the extraordinarily low incidence of leucoplakia linguæ in women, only 3·5 per cent. of 848 cases collected by Cumston (1923) and 4·2 per cent. of 286 more accurately investigated cases collected by Lane-Claypon. It is particularly with reference to the tongue that a preponderatingly syphilitic ætiology is assigned. In leucoplakia of the lip there is little or no evidence that syphilis plays any part. Brofeldt (1927) investigated 25 cases of leucoplakia and 26 of cancer of the lips seen by him at Helsingfors in the period 1902–26. In none was there a positive Wassermann reaction or other evidence of syphilitic infection, and less than half were smokers.

Leucoplakia vulvæ is not a syphilitic affection; all observers are agreed on this point. It is probably related in most cases to cessation of the ovarian function, the average age at onset being 49 years (Taussig, 1929). In patients where the disease originates before the menopause there is usually a menstrual abnormality. Berkeley and Bonney suggest that coitus is an *important factor*. The *ætiology* of leucoplakia of the portio vaginalis cervicis is even more obscure, although here again syphilis is discounted by most observers. According to Hinselmann (1928) most cases are due to "external irritative influences."

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* The Croonian Lectures delivered before the Royal College of Physicians of London on June 4th, 9th, and 11th, 1931.

In the urinary tract chronic inflammatory and obstructive lesions are usually present. Thus Hennessey (1927) found the following associated conditions in 80 collected cases: cystitis, 58; obstructive lesions, 31; pyelonephritis, 25; calculus, 20; tuberculosis, 6; carcinoma, 4. In this series the bladder was affected with leucoplakia 47 times, the pelvis 32 times, and the ureter 11 times. In another (overlapping) series of 77 cases collected by Redewill (1929) the following lesions were present: chronic pyonephrosis, 25; hydronephrosis, 25; stone in the kidney, 10; stone in the ureter, 2; stone in the bladder 3; stone in the opposite kidney and ureter, 1; tuberculosis, 7; carcinoma, 4. Redewill makes the interesting suggestion that vitamin deficiency (especially deficiency of vitamin A) is an important ætiological factor (cf. xerophthalmia, which is a closely similar change in the conjunctival epithelium resulting from vitamin A starvation), and claims to have cured two cases by increasing the vitamin content of the diet and administering parathyroid.

RELATION TO CARCINOMA.

This has been so recently discussed by Lane-Claypon for carcinoma of the tongue that I content myself here with a brief reference to some of her main conclusions. She finds that up to the present time no data are available which enable the frequency of the supervention of cancer of the tongue in syphilitic subjects (or in those with leucoplakia, syphilitic or otherwise) to be ascertained. Yet there is no doubt that the association exists. The sex-incidence is similar; both show a remarkable preponderance in males (leucoplakia 95·8 per cent., carcinoma 90·2 per cent.). In a collected series of 447 cases of leucoplakia, 130 (29·1 per cent.) had already become cancerous, and in view of the youth of some of the patients there was still abundant time for others to develop malignancy. Perrin's figures, quoted by Lane-Claypon, are of interest. He analysed 102 cases of leucoplakia buccalis as follows:—

		With cancer.
Syphilitic (64).		
Leucoplakia of cheek and lips ..	11	0
,, ,, tongue	53	10
Non-syphilitic (38).		
Leucoplakia of cheek and lips ..	15	0
,, ,, tongue	23	9

He concludes that syphilis does not predispose to leucoplakia of the lips or cheeks but does so for the tongue, and that syphilis in combination with tobacco is the commonest cause of cancer of the tongue.

The evidence for an association between leucoplakia and carcinoma of the œsophagus is extremely slight. I have only been able to find casual references to the subject in the literature, and my own experience in the post-mortem room has been of a negative kind.

Leucoplakia vulvæ is an accepted precancerous lesion, although here again it is impossible to get reliable figures. Berkeley and Bonney (1910), in reporting their personal experience of 58 cases of carcinoma vulvæ, state that they have not yet seen a case in which leucoplakia did not coexist. They report at the same time 19 cases of leucoplakia without malignancy. Taussig (1929), in a series of 76 cases of cancer of the vulva, noted leucoplakia in 39. In the same period he saw 40 cases of leucoplakic vulvitis without malignancy. Carcinoma vulvæ is more frequently multiple in origin than any of the commoner forms of malignant disease; 4 of Berkeley and Bonney's 58 cases were of this class, and I have recently seen a case of widespread leucoplakia of vulva, perineum, and anus in which early but unmistakable carcinoma was present at two widely separate points, one on a labium minus, the other on the anus.

The relationship between leucoplakia and cancer of the cervix is less securely founded. Hinselmann (vide supra), the chief exponent of leucoplakia cervicis as a pathological entity, believes that conservatively treated cases become carcinomatous in a few years, that in fact such leucoplakias represent the early non-invasive stage of carcinoma and not merely a precancerous condition. Cases supporting this view have been published by Rogge (1929) and Landesmann and Einoch (1929), but the total available evidence is scanty and unconvincing.

In the urinary tract also the evidence for an association between leucoplakia and cancer is inadequate. In recent years several American authors have analysed the literature, but the total number of cases is small. In 80 cases collected by Hennessey (1927) there were 4 cases of carcinoma, all squamous, an incidence of 5 per cent. Redewill (1929), in a partially overlapping series of 77 cases, had 4 cases of carcinoma, 3 in the bladder and 1 in the pelvis.

It may be concluded, therefore, that leucoplakia linguæ and leucoplakia vulvæ are definitely precancerous lesions, the former usually though not invariably due to syphilis, with heavy smoking and drinking as auxiliary factors. Leucoplakia vulvæ is not syphilitic. So far as the œsophagus, larynx, cervix uteri, and urinary tract are concerned, an association between leucoplakia and cancer is still unproved.

Lesions Due to Burns and Caustics.

Cancer of the lip.—One of the remarkable features of this disease is the great difference in its incidence in the two sexes. In a collected series of 4839 cases (Lane-Claypon, 1930) the proportion in males was 93·5 per cent. Another important point is the comparative rarity of cancer of the upper lip, 5·8 per cent. of a series of 3763 cases. Yet nearly one-quarter of all cases in women (50 out of 210) are in the upper lip, leaving for men only 88 out of 2466 cases (3·6 per cent.) so situated. Lane-Claypon discusses the ætiology at length, and concludes that there is no statistical evidence to support the view that smoking *as such* is causally related. There is reason to believe, however, that the unglazed clay pipe, especially when broken off short, may cause such chronic burning of the lower lip (with which it is in much more continuous contact) as to lead to cancer. Brewer (1923) states that in the district of Columbia only 8·04 per 100,000 white women over the age of 70 die from cancer of the lip, whereas the corresponding figure for negresses, a large proportion of whom smoke clay pipes, is 30·1 per 100,000.

The importance of prolonged exposure in the open air is stressed by Young and Russell (1926), who find that in agricultural labourers, merchant seamen, dock-labourers, and outdoor railwaymen cancer of the lip is 200 to 300 per cent. in excess of what might be expected. Masons, general labourers, farmers, graziers, and paviours come next with 60 to 100 per cent. excess. These open-air workers have in common unrestricted opportunities for smoking, and in the past, at least, clay pipes were much in favour amongst them. They mention the fact that coal-miners working below ground, where smoking is forbidden, contrast with those working above ground in not suffering from excess of lip cancer. Young and Russell suggest that tobacco smoke may contain distillation products which act in a similar way to coal-tar and soot. There is no evidence to incriminate syphilis, and little or nothing to suggest an association with leucoplakia.

Betel-nut cancer of the cheek.—This also is fully discussed by Lane-Claypon (1930). It is clear that in certain districts of India and the East where betel-chewing is a widespread habit, the incidence of carcinoma of the cheek is extraordinarily high. Thus Fells in Southern India found that out of 377 cases of epithelial cancer seen by him, 91·5 per cent. were connected with the buccal cavity, 83·2 per cent. originating in the cheek, 9·3 per cent. in the tongue, and 7·5 per cent. in the lip. The betel "quid" is ordinarily carried inside the cheek, and it is on the buccal mucosa at this point, just opposite the molars and pre-molars, that the changes occur which ultimately lead to malignancy. Inflammatory thickening and roughening of the mucosa, leucoplakia, and epithelial denudation occur, and are followed by progressive ulceration.

There is, however, great variation in the cancer incidence in different betel-chewing populations. Thus Snijders and Straub (1923) found no evidence of its frequent occurrence in Dutch East Indies, where betel-chewing is common: Maxwell (1924) and Wells (quoted by Lane-Claypon) report similar experiences from Formosa and Guam. Snijders and Straub, from a review of the literature, give the following figures: Travancore, 652 buccal cancers amongst 1700 in all sites (38 per cent.); Madras, 411 in 976 (42·1 per cent.); Ceylon, 422 in 1325 (32 per cent.). Degorce in Tonkin saw only a few cases, while Montel in Saigon, in a similar (Indo-Chinese) population, saw many oral cancers. It is suggested that the difference may be due to the composition of the "quid," which varies in different countries and in different districts. Sabesan (1928) believes that in Madras the chewing of tobacco in addition to betel-nut is responsible for the high incidence, while for Singhalese, van Dort (1923) blames the short strong cigar much used by natives of Ceylon.

Betel-nut cancer, then, affords an excellent example of the importance of local factors in cancer causation, ranking in this respect with "kangri" cancer, tar and soot cancer, and mule-spinners' and X ray cancer.

Cirrhosis of the Liver.

INCIDENCE OF PRIMARY CARCINOMA.

Primary carcinoma of the liver is a rare disease in the white-skinned races. In Leeds, in 12,800 autopsies† during the period 1910–31, there were 14 certain cases, or 0·11 per cent. Even if 7 doubtful cases be added to this list the incidence is still only 0·16 per cent. If, however, only cases of 30 years of age and over are included, these figures become increased to 0·16 and 0·25 per cent. respectively.

Very similar figures have been recorded by other observers, both here and in America. It would appear, however, from numerous published observations that there is a much higher incidence among many non-white-skinned races (Table I.).

TABLE I.—*Racial Incidence of Primary Carcinoma of Liver.*

—	Total autopsies.	Cases of primary carcinoma of liver.	Percentage incidence.
English (Hale-White, Stewart)	31,300	39	0·12
Hungarian (Goldzieher and v. Bokay)	6,000	18	0·3
American and Canadian* ..	17,736	26	0·146
Chinese and Javanese† ..	1,075	25	2·3
South African Natives (Strachan)	1,100	22	2·0

* Clawson and Cabot, Fried, v. Glahn and Lamb, Counseller and McIndoe, Ophüls, and Strong and Pitts.

† Snijders and Straub, Ophüls, Strong and Pitts.

These figures show a statistically significant difference not only between English and American whites on the one hand and the Chinese-Javanese group on the other (2·21±0·46 per cent., and 2·18±0·46 per cent. respectively), but also between the two former groups and the Hungarians (0·18±0·07 per cent., and 0·154±0·076 per cent.).

Indirect evidence of racial variation is also available. Harvey Pirie (1921–22) found 36 primary cancers of the liver amongst 91 carcinomata in South African natives, whilst Snijders and Straub (1923) in the Dutch East Indies had 83 amongst 447 tumours examined (18·6 per cent.). Almost the whole of these liver cancers came from Javanese and Chinese patients, amongst whom they represented 57 per cent. and 32 per cent. respectively of all tumours examined. Snijders and Straub have also collected from the literature of the Far East much additional information on this point. Table II. is compiled from their data.

TABLE II.—*Incidence of Primary Carcinoma of the Liver in the Far East.*

Race.	Autopsies.	Cases of primary carcinoma of liver.	Incidence.
Japanese	12,212	125	1·02
Chinese	1,057	13	1·23
Javanese	658	8	1·22

Various explanations of this heightened racial incidence have been forthcoming. In the Far East and in South Africa the hepatic cirrhosis of schistosomiasis has been regarded as a possible factor, and in China, infestation by another fluke, *Clonorchis sinensis*. These are discussed in Lecture III. Snijders and Straub suggest that the "repeated and chronic affections of the sources of the portal vein" so frequently present in the native inhabitants of tropical countries "may play a part in the ætiology of cirrhosis and cancer of the liver." van Dort (1923) makes the suggestion that the varied incidence of primary cancer of the liver in different countries has a racial basis. He points out that in Europe there is a higher incidence among Magyar and Mongolian races than among those of Aryan stock; that Madras, peopled by Dravidians, shows a high rate, Calcutta and Colombo, inhabited by Aryans, a low, while the

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† It is a serious objection to much of the published statistical material available that the age-distribution of the hospital populations from which it has been obtained is not clearly indicated. The figures for the Leeds General Infirmary during the period under review are as follows:—

Age- and Sex-Distribution of 12,800 Consecutive Autopsies at the Leeds General Infirmary, Jan. 1st, 1910, to May 5th, 1931.

Decade.	Males.	Females.	Totals.	
0– 9.. ..	1526	1079	2605	4887 under 30.
10–19.. ..	725	420	1145	
20–29.. ..	656	481	1137	
30–39.. ..	868	548	1416	7913 30 and over.
40–49.. ..	1147	657	1804	
50–59.. ..	1489	770	2259	
60–69.. ..	1225	559	1784	
70–79.. ..	412	158	570	
80–89.. ..	51	25	76	
90–99.. ..	2	2	4	
Totals ..	8101	4699	12,800	

incidence is again high amongst negroes, Chinese, and Javanese.

VARIETIES OF CARCINOMA.

There are two main varieties of hepatic carcinoma, the liver-cell type or hepatoma, and the bile-duct type or cholangioma (Yamagiwa, 1911). The older classification of Eggel (1901) into massive, nodular, and diffuse has a certain descriptive value, while the separation of a special type of "cancer avec cirrhose" (Hanot and Gilbert, 1888), has much to be said for it, especially on clinical grounds. Both histogenetic types may arise in cirrhotic livers, and may assume one or other of the three anatomical forms.

The main distinguishing features of the two types are briefly these (Winternitz, 1916).

(*a*) Liver-cell cancer has a trabecular structure, the cell columns being solid as a rule, although lumina may be present and may contain bile. Stroma is scanty in the extreme, practically only a capillary core; and the tumours are, in consequence, very soft. They are very liable to undergo central necrosis and hæmorrhage. The scantiness and looseness of the stroma is occasionally responsible for a remarkable pseudo-papillomatous formation (Fried, 1924; Keith and McNair, 1930). These apparent intracystic papillæ, which are really intravascular, are simply solid or luminated epithelial columns each enclosed in a delicate sheath of endothelium. The cellular structure is polymorphic, but nearly always one can find groups of cells with granular, well-stained cytoplasm, closely resembling the normal parenchyma cells of the liver. The formation of enormous giant cells, both mono- and multinuclear, is a not uncommon feature (van Heukelom, 1894; Muir, 1908), and plugs of inspissated bile may even be present within their cytoplasm (Rowen and Mallory, 1925).

(*b*) The bile-duct carcinomata are tubulo-adenomatous, have a more or less abundant, densely fibrous stroma, and are composed of cubical or subcolumnar cells with clear cytoplasm resembling the lining epithelium of the bile canaliculi. Atypical varieties of both tumours occur, and tumours apparently of mixed type, some being "so far removed from their usual morphology that some doubt must always remain regarding their true origin" (Ewing, 1928). Bile may be present in either variety, in the one case the product of the functional activity of the tumour cells, in the other a derivative of the surrounding healthy liver entering secondarily from without. Many hepatomas are yellow or orange in colour as a result of their high bile-pigment content, and in contradistinction to cholangiomas bile may be formed in the secondary deposits in the lungs (Cloin, 1901; Ménétrier, 1908; Ribbert, 1909; Parkes Weber, 1910; Fried, 1924).

Liver-cell carcinoma is much the commoner. In Eggel's collected series the ratio was 7 to 1, in Yamagiwa's roughly 2 to 1, and in Goldzieher's 3·5 to 1. In my series there were 9 hepatomas and 4 cholangiomas. Table III. shows that there is little or no difference in the comparative frequency in the white-skinned and coloured races.

TABLE III.—*Comparative Frequency of Liver-cell and Bile-duct Carcinomas.*

—	Total carcinomas.	Liver-cell type.	Bile-duct type.
European and American* ..	167	139	28
		Ratio 5 : 1	
Japanese (Yamagiwa)	42	27	15
Chinese (Snijders and Straub, Ophüls, Strong and Pitts) ..	36	30	6
Javanese (Snijders and Straub) ..	57	56	1
Negroes (Winternitz, Harvey Pirie)	34	32	2
	169	145	24
		Ratio 6 : 1	

* Eggel, Goldzieher and v. Bokay, Winternitz, Clawson and Cabot, Fried, Ophüls, Counseller and McIndoe, Strong and Pitts, Stewart.

RELATION OF CIRRHOSIS TO CARCINOMA.

That cirrhosis of the liver is a precancerous condition is now generally accepted. Most of the statistical evidence in support of this belief comes from figures showing a high incidence of cirrhosis in cases of primary cancer. Statistics showing the comparative frequency of primary carcinoma in cirrhotic and non-cirrhotic livers respectively are remarkably few. My own figures have been worked out on this basis.

Multilobular or portal cirrhosis is a disease of middle and later life. After excluding from my series all cases of Banti type, and all cases of post-necrotic (post-atrophic) fibrosis, whether accompanied by multiple nodular hyperplasia or no, there remain 269 patients with cirrhosis of whom five only were under the age of 30. All the cases of primary carcinoma but one were also over 30, and I have therefore made a correction for age by including only those who were 30 years of age or over.

TABLE IV.

Incidence of primary cancer of the liver in 7913 patients 30 years of age and over (from a consecutive series of 12,800 autopsies at all ages at the Leeds General Infirmary).

		Per cent.
Cases without cirrhosis	7619	—
Cases of primary cancer therein ..	4	0·052
(With 7 doubtful cancer cases included)	11	0·144
Cases with cirrhosis	264	—
Cases of primary cancer therein ..	9	3·41

Table IV. shows, therefore, an enormous preponderance in favour of the cirrhotic group.

Two incidence-rates for the non-cirrhotic cases are given, one including only those primary carcinomas which satisfy the most stringent requirements, the other with the doubtful cases added. With the former the cancer incidence in cirrhosis is 66 times, with the latter 24 times greater than in the non-cirrhotic group. Even for the latter the difference is statistically significant (3·27 ± 1·12 per cent.).

Similar findings were obtained by Ophüls (1926). In 128 cases of cirrhosis of the liver over the age of 30 there were 8 with primary carcinoma (6·2 per cent.), while in the corresponding group without cirrhosis there were 3 cases of cancer in 2111 (0·14 per cent.), a ratio of 44 : 1.

Blumenau (1920–21), in 12,761 autopsies, encountered 198 cases of cirrhosis of all grades, of which 7 were associated with primary carcinoma (3·5 per cent.).

These three series include all grades of cirrhosis recognisable by the naked eye, whereas carcinoma, when it occurs in a cirrhotic liver, does so as a rule late in the disease. In my series, if the slighter cases of cirrhosis are excluded, there remain, over the age of 30, 124 cases of cirrhosis with 9 cases of cancer, an incidence of 7·3 per cent.

Approaching this problem from the other direction, we find in the literature abundant evidence in support of the contention that a large majority of carcinomas of the liver, especially those of liver-cell type, arise in cirrhotic organs (Table V.).

TABLE V.—*Frequency of Cirrhosis in Cases of Primary Carcinoma of the Liver.**

—	Cases.	With cirrhosis.
Liver-cell carcinoma ..	246	219 (89·0 per cent.)
Bile-duct ,, ..	49	25 (51·0 ,,)

* Collected from the series of Eggel, Goldzieher and v. Bokay, Karsner, Yamagiwa, Winternitz, Harvey Pirie, Snijders and Straub, Fried, v. Glahn and Lamb, Counseller and McIndoe, Strong and Pitts, and Stewart.

The incidence of cirrhosis is thus significantly higher in liver-cell than in bile-duct cancer (difference 38·00 ± 7·41 per cent.).

Carcinoma occurring in a cirrhotic liver is the end-stage of a well-recognised series of pathological changes. Both portal cirrhosis and acute cytolytic necrosis are due to the action of toxic substances, some of which are either definitely known or strongly suspected—e.g., trinitrotoluene in the one case, and alcohol or some associated substance in the other. But there is a vast difference in the mode of action of the causative agents in the two diseases. Cytolytic necrosis occurs rapidly, and the final result depends partly on the severity of the intoxication, partly on the extent of the destructive lesion. If necrosis is very extensive death ensues within a few days, and the condition is known as acute yellow atrophy. If a certain, perhaps even a small, amount of liver tissue withstands the toxic onslaught, the patient may survive for some weeks or months, and at autopsy the destroyed liver tissue is found to have become replaced by cellular fibroblastic tissue, the surviving islets of parenchyma being in a state of more or less active proliferation. This is the stage of subacute atrophy or necrosis. Finally there are the cases which survive for many months or years, and in whom the regenerated liver tissue compensates more or less adequately for what has been destroyed. Such livers often present the appearance known as multiple nodular hyperplasia, with numerous rounded nodules of regenerated functioning liver tissue separated by broad tracts of post-necrotic fibrosis. In cytolytic necrosis all the damage to the liver is done at one blow. Once the destroyed tissue has become fibrosed and a certain degree of regenerative hyperplasia attained the lesion becomes static.

In cirrhosis, on the other hand, the toxic action is long continued, and the destructive effect, with its associated demand for compensatory hypertrophy, probably lasts many years. The lesion, in short, is a progressive one. I believe it is for this reason that the process does not always stop short at the stage of multiple nodular hyperplasia. From time to time cases are encountered in which actual liver-cell adenomata are formed, and this in turn may be followed by malignancy. Sabourin (1881, 1884) was the first to suggest that multiple nodular hyperplasia might be an intermediate stage between cirrhosis and cancer, a view since strongly supported by Orth (1887), Schmieden (1900), Muir (1908), Turnbull and Worthington (1908*a*), and others. I believe, however, that this applies only to the nodular hyperplasia of cirrhosis. I am unaware of any reported case of primary cancer arising in a liver the seat of post-necrotic fibrosis with multiple nodular hyperplasia. In none of 13 cases of post-necrotic fibrosis encountered in the post-mortem room at Leeds was there any evidence of new growth. In the patients who recover from cytolytic necrosis and in whom the regenerated liver is sufficient to maintain life, no further destruction of cells takes place (unless they go through a fresh attack, which is rare), and no further demand for compensatory hypertrophy. In cirrhosis there is "a progressive destruction of liver-cells, followed by a progressive compensatory hypertrophy and hyperplasia" (Muir, 1908), which in a not inconsiderable number of advanced cases "oversteps the normal, and takes on the autonomous character of a new growth."

An interesting controversy has ranged around the question of the unicentric or multicentric origin of primary liver-cell cancer. The chief supporters of the latter (and earlier) view are van Heukelom (1894), Löhlein (1907), Muir (1908), Goldzieher and v. Bokay (1911), and Yamagiwa (1911); of the former, Ribbert (1909, 1911), Karsner (1911), Winternitz (1916), and Counseller and McIndoe (1926). That adenomata of the liver are frequently multiple, especially in the cirrhotic organ, everyone will admit. So far as primary liver-cell cancer is concerned, I am strongly of the opinion that most, if not all, of the cases of apparently multicentric origin can be explained in other ways. Primary cancer, especially of the liver-cell type, readily invades the portal vein, which becomes occupied by a solid yellowish mass, partly thrombus, partly tumour tissue. The growth extends along the lumen in both directions from the point of entry, ultimately forming a tree-like cast of the affected portion of the portal system. It is these growth-distended vessels seen on section which give the appearance of a tumour of multicentric origin. Furthermore, when once the portal system has been invaded dissemination to other parts of the liver readily occurs (Willis, 1930). Invasion of the hepatic vein is less common, and in rare instances the inferior vena cava is permeated and obstructed by growth (Fabyan, 1907; von Glahn and Lamb, 1924; Rowen and Mallory, 1925; Counseller and McIndoe, 1926).

Bile-duct carcinoma, although it grossly invades both portal and hepatic veins less frequently than liver-cell cancer, is more liable to give rise to extrahepatic metastases. Table VI. is compiled from my own cases, and from those of Muir (1908), Turnbull and Worthington (1908*b*), Karsner (1911), Winternitz (1916), von Glahn and Lamb (1924), and Counseller and McIndoe (1926).

TABLE VI.—*Frequency of Vascular Permeation and Extrahepatic Metastasis in 44 Cases of Primary Carcinoma of the Liver.*

—	Cases.	Invasion of		Regional gland secondaries.	Pulmonary secondaries.	Bronch. gland secondaries.	Deposits elsewhere.
		Portal vein.	Hepatic vein.				
1. Hepatoma ..	33	28	4	4	6	0	0
2. Cholangioma	11	5	0	4	3	3	6

In all, there were 16 cases (9 out of 33 hepatomas and 7 out of 11 cholangiomas) with extrahepatic metastases (36·4 per cent.). In Eggel's series of 163 cases there were 66 with extrahepatic metastases (40·5 per cent.), including 23 cases of lung involvement —14 per cent., as compared with 20 per cent. in the above series.

It is scarcely necessary after this to discuss the various other hypotheses as to the relation of the cirrhosis and the cancer; that the two are independent, that they occur simultaneously in response to some common stimulus (Hanot and Gilbert, 1888), that the cancer is the cause of the cirrhosis. For the first and second no case has been made out. With regard to the third, it is true that liver-cell carcinoma in particular may stimulate the formation of a wall of fibrous tissue around it, but this is a strictly local development, and does not extend into the normal parenchyma of the rest of the organ.

CIRRHOSIS AND SARCOMA.

Sarcoma of the liver is an extremely rare disease. As in carcinoma there is a certain association with cirrhosis. Jaffé (1924) has collected and analysed the available data. He finds that of 48 cases of sarcoma 15, or 29·2 per cent., were accompanied by cirrhosis.

Hæmochromatosis.

Hæmochromatosis is a disease in which enormous quantities of the iron-containing pigment hæmosiderin are deposited in various organs of the body, but especially in the liver, which, whether as a result or as a cause of the siderosis, or independently, becomes the seat of multilobular (portal) cirrhosis of the usual type. The deposition of pigment is unassociated with other evidences of excessive hæmolysis, and belongs therefore to an entirely different category from the siderosis of Addisonian anæmia or hæmolytic jaundice. The free iron content of the liver may be as much as 6 or 7 per cent. of the dry weight, and the total iron content anything up to 30 g. or more instead of the normal 0·3 g. or less (Muir and Dunn, 1914–15).

There occurs also an enormous accumulation of hæmosiderin in the upper abdominal lymph glands, especially those of the cœliac group, where the iron content may be 14·69 per cent. of the dry weight (Anschütz, 1899). It is clear that the bulk of this pigment is transported thence from the liver, to some extent also from the pancreas. No such transportation to or accumulation of pigment in the cœliac glands occurs in the hæmolytic anæmias, probably because of the need for and the availability of the iron-containing fraction for further erythropoiesis.

After the liver, in pernicious anæmia the kidneys show the largest amount of pigment, and may even be the organs chiefly or solely affected. In hæmochromatosis renal siderosis is usually very slight. In Muir and Dunn's case the iron content was only 0·406 per cent., as compared with 6·43 per cent. in the liver and 2·49 per cent. in the pancreas. Apart from the liver and kidneys no appreciable degree of siderosis occurs in pernicious anæmia. In hæmochromatosis the pancreas ranks next to the liver and lymph glands as the chief site of iron deposition. It is unusual for the spleen to be much affected, but the heart-muscle, suprarenals, skin, thyroid, prostate, salivary glands, stomach, and choroid plexuses may all show considerable or even great pigmentation.

INCIDENCE.

In the collected series of 38,095 autopsies in five British hospitals shown in Table VII. there are 52 cases of hæmochromatosis (0·136 per cent.). Strachan (1929) found a much higher incidence both in South African natives (3·0 per cent.) and in the white inhabitants of that country (1·38 per cent.), but failed to discover any satisfactory explanation. In my series there were 264 cases of cirrhosis of the liver 30 years of age or over, and as all my 13 cases of hæmochromatosis showed cirrhosis and were over 30, the incidence of hæmochromatosis in this group is 4·9 per cent. Hæmochromatosis, however, is mainly a disease of males—there were no women in my series—and here the incidence rises to 7 per cent.

ÆTIOLOGY.

The ætiology of hæmochromatosis is very fully and adequately discussed by Rolleston and McNee (1929), and I shall only refer here to one or two salient points. It is a very obscure problem, and no definite conclusions can as yet be stated.

(1) There is general agreement that the siderosis is not dependent on increased hæmolysis. As already shown, the amount and distribution of the pigment differs widely in the two cases, and there is no evidence of excessive hæmolysis.

(2) There is a preponderance of opinion in favour of the view that in the liver the cirrhosis is antecedent to the siderosis, and in support of this the fact that chronic alcoholism is a frequent precursor of both diseases has been cited. This ætiological conception, however, fails to explain the widely generalised siderosis of hæmochromatosis, nor does it throw any light on the fibrosis of the pancreas which occurs in some cases.

(3) Mallory and others (Mallory, Parker, and Nye, 1920–21; Mallory, 1925, 1926) have advanced the view that the cause of the disease is chronic copper poisoning, and have adduced much clinical evidence in support of their contention. It is indeed a remarkable fact that Mallory should have had such an extraordinary run of cases since long-suffering Americans have taken to distilling their own "hooch" in copper-tubed stills, but there remains the difficulty of accounting for the vast quantities of iron present. Clearly in many of the cases the process of siderosis must have been in existence much longer than the supposed period of exposure to copper, dating from days when good corn and rye whisky was the favourite tipple of American inebriates. If, on the other hand, the source of the copper is the lining of pans used for jam-making and other culinary purposes, or the colour-preservatives added to canned vegetables, why is the disease limited to such an extraordinarily small fraction of the population, and in particular, why is there such an extreme preponderance in the male sex? Mallory's experimental results in support of the copper theory fail to carry conviction (Flinn and von Glahn, 1929; Polson, 1929). It may be mentioned that in Korea, where bronze and copper vessels are habitually used, R. G. Mills (1925) found no evidence either of hæmochromatosis or of an increased incidence of diabetes.

(4) There remains the hypothesis, which unfortunately does not carry us much further, that the essential factor is "a special affinity of the tissues and organs for iron" (Muir, 1921). The *cause* of this accumulation is unknown, although the *source* of the iron must obviously be the food. The total iron content of the body in advanced cases is so enormous that at the normal rate of intake (10 milligrammes of iron per day on an ordinary diet (Stockman, 1895, 1897)), it would require many years to accumulate, even if all the iron ingested were retained. It is even possible that the condition is lifelong, but as against that must be set the fact that the disease, even in its early stages, is hardly ever encountered before the age of 30. That there is a failure of elimination of iron may be assumed.

It is an equally attractive hypothesis that damage to parenchyma cells by surcharge with iron pigment is the cause of both hepatic and pancreatic sclerosis, perhaps also of a cortical adrenal lesion leading to genuine Addisonian pigmentation. Contrary to Rolleston and McNee, I find that siderosis of the cœliac lymph glands sets up a definite fibrosis of these structures, nor do I agree that the absence of hepatic fibrosis in the hæmolytic anæmias, where siderosis is relatively slight and probably intermittent, is an argument against this hypothesis. Siderosis of liver-cells in varying degree is present in many cases of ordinary multilobular cirrhosis, but there is no evidence of any close relation between this condition and hæmochromatosis.

RELATION TO CARCINOMA.

Hæmochromatosis, when recognisable as such in the post-mortem room, is invariably accompanied by some degree of hepatic cirrhosis, and might therefore be expected to have an association with primary carcinoma of the liver. My interest in this side of the problem has been stimulated by the fact that in the past 16 years I have encountered no fewer than three instances of this association in a series of 13 cases of hæmochromatosis seen in the post-mortem room at Leeds. In such a small series one naturally assumed that this was a mere error of random sampling, and in order to get a more truthful figure I have collected a number of series, published and unpublished. Through the kindness of Profs. Muir, Turnbull, and Kettle, and Dr. Newcomb, I have been supplied with the lists of cases of hæmochromatosis occurring at the Western Infirmary of Glasgow, the London Hospital, and St. Bartholomew's and St. Mary's Hospitals respectively during the last 15 or 20 years. In making a collection from the literature only *series* of cases have been included, not isolated examples, since it seemed probable that the latter would include an undue proportion of rarities such as the one under discussion. Table VII. gives the results of the inquiry.

TABLE VII.—*Incidence of Primary Carcinoma of the Liver in Hæmochromatosis.*

—	Autopsies.	Cases of hæmochromatosis.	With primary cancer of liver.	Percentage.
Unpublished Series.				
Glasgow, Western Infirmary, 21 years	4,034	14	1	—
Leeds, General Infirmary, 21 years	12,800	13	3	—
London Hospital, 17 years	10,626	15	1	—
St. Bartholomew's Hospital, 20 years..	8,147	4	0	—
St. Mary's Hospital, 14 years	2,488	6	1	—
Totals	38,095	52	6	—
*Published series** ..	—	66	6	—
Grand total (white subjects) ..	—	118	12	10·2
Strachan (South African Natives) ..	1,100	33	3	9·0
Grand total ..	—	151	15	9·93

*Those of Althausen and Kerr, Blanton and Healy, Bork, Letulle, Mills (E. S.), Ophüls, and Strachan.

The total figure (9·93 per cent.) is a somewhat higher incidence than is met with in cirrhosis generally —viz., 3·41 per cent. A fairer comparison, however, would be with cases of established cirrhosis after excluding the slighter grades. In my series there were 124 such cases, with 9 cases of cancer, an incidence of 7·3 per cent. As the difference between these rates (2·67 per cent.) is less than its standard error (3·37), it is not possible to attach any significance to the apparently higher rate in hæmochromatosis. The causative factor in both groups is the cirrhosis, the siderosis probably playing no direct part. In passing it may be mentioned that cases of primary carcinoma of the pancreas with hæmochromatosis have been reported by Critchlow (1929) and Strachan. It is unlikely that this association is other than accidental.

Primary carcinoma of the liver in hæmochromatosis is similar to the disease as it occurs in ordinary portal cirrhosis. For purposes of comparison I have collected in Table VIII. all the 14 reported cases which I have been able to find in the literature, adding thereto my own three. I know of seven other unreported cases, four in Great Britain (Muir, Turnbull, Dunn, and Polson), and three in South Africa (Strachan).

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TABLE VIII.—SEVENTEEN CASES OF HÆMOCHROMATOSIS WITH PRIMARY CARCINOMA OF THE LIVER.

Case No.	Author and date.	Sex and age.	Duration of symptoms (years).	Alcoholism.	Glycosuria.	Fibrosis of pancreas.	Pigmentation of skin.	Jaundice.	Ascites (c.cm.).	Size of liver (gm.).	Type of cancer.	Siderosis of tumour cells.	Invasion of veins.	Secondaries.
1	Letulle, 1897.	M. 50	3/12	–	–		–	–		2150	Hep.	–	Portal.	—
2	Rindfleisch, 1901.									Red.	"	+		
3	Löhlein, 1907.	M. 57	5		–	+	–	+	1700 hæm.	Enl.	"	–	Portal, hepatic, inf. vena cava.	Lungs, bronchial glands.
4	Winternitz, 1916.	M. 52	2/52 +31	++			–	–	700	4200	"	–	Portal.	–?
5	Achard and Leblanc, 1921.	M. 55	3/12	+++	–		+++*	+	+++ hæm.	3450	Chol.	–		Lungs.
6	Blanton and Healy, 1921.	M. 49	6/12	–	+	+	+	–	++	5085		+	–	Pancreas, peritoneum, pleura.
7	Mills (E. S.), 1924. 1	M.						–	–	5400	Hep.			
8	" " " 2	M.						+	+	1900	"			
9	" " " 3	M.						+	+	Enl.	"			
10	Althausen and Kerr, 1927.	M. 67	1 2/12	+	–	+	++	+	+	"	"		Portal.	Local glands.
11	Hibbs, 1927.	M. 64	Hours.	+++			–	–	–?	2900	Chol.	–	"	–?
12	Donaldson, 1929.	M. 59	2/12	–	–	+	–	sl.	+++ hæm.	Enl.	Hep.	–	–	–?
13	Keith and McNair, 1930.	M. 58	10	–	+	+++	+	–	6000	4320	"	–	–	–
14	Orr, 1930.	M. 54	6/52	–?	–		+	–	1130	2700	"	–	–	–
15	Stewart, 1931. 1	M. 49	1	+++		+	–	–	+ hæm.	3090	"	–	Portal.	–
16	" " 2	M. 71	5/12	+++			–	–	+ hæm.	Enl.	"	–	"	Local glands.
17	" " 3	M. 59	Hours.	–		tr.	+	–	–	1390	"	–	"	–

* Addison's disease from tuberculosis of the adrenals coexisted.
Red. = reduced; Enl. = enlarged; Hep. = hepatoma; Chol. = cholangioma.

incapable of carrying on with his work without periods of rest. He had lost weight. In 1927 his condition was believed to be due to myocardial failure, but this opinion was negatived by the report of the cardiac specialist. Rest and tonics were prescribed. In October, 1928, he had some lower abdominal discomfort, and complained of constipation and of feeling the whole of the cæcum against the abdominal wall.

The cæcum and descending colon were thickened and easily palpable, but there was no tenderness. A barium X ray meal on March 21st, 1929, showed the following abnormalities:—(1) Hyper-activity of the duodenum. 6½ hours after ingestion: (2) cæcal pole very movable. Appendix partly but only slightly filled. 8½ hours after ingestion: (3) freely movable appendix not obvious either on film or on screen. 48 hours after ingestion: (4) cæcum contains some barium mixed with food. The radiologist further reports: (5) "Appendix did not fill like 99 per cent. of normal ones, but that is the only point against it."

The condition was believed to be due to visceroptosis and overwork. One month's rest in a nursing home with abdominal massage was prescribed, preceded by two weeks' holiday. The constipation was entirely relieved, but the "fatigue" continued unrelieved.

Six months later, the fatigue condition having become unutterably intolerable, and the patient totally unable to carry on with his work, appendicectomy was decided upon. At operation on Nov. 22nd, 1929, the cæcum was found adherent to the abdominal wall. There was a mass of adhesions round the appendix, which was twisted on itself, the two loops being adherent. The appendix was opaque and thickened, with congested vessels. Twelve months later the toxæmic symptoms had entirely disappeared, and the patient was very well.

GROUP IV.—MALAISE, LASSITUDE, AND ABDOMINAL SYMPTOMS.

CASE 16, a boy aged 16½ years, stated that from Christmas, 1929, to February, 1930, he had had discomfort in the epigastrium a quarter of an hour after meals, but no vomiting. On one occasion he had had acute pain round the umbilicus, lasting for five minutes. This had doubled him up, but had not been accompanied by vomiting. He had had constipation for 12 months.

Increased resistance was found in the upper two segments of the right rectus. A barium meal on Feb. 26th, 1930, showed the following abnormalities:—Excessive peristalsis, to-and-fro movement in the duodenum. 7 hours after ingestion: (1) appendix partly filled; ? kinked; no tenderness. 8½ hours after ingestion: (4) appendix slightly movable; no tenderness. The radiologist further reports: (3) "*Previous to giving the meal, a film of the abdomen* shows a large calcareous mesenteric gland."

Although in this case the diagnosis of "poisoning appendix" was made, the surgeon did not agree, and

Case	Age.	Shown by X rays: alterations from normal.		—	Main features at operation.	Age.	Case
		In upper abdominal tract.	In cæcal area.				
			Symptomless Pyrexia (Two Cases).				
1	38	—	Appendix not seen. Cæcum not movable. Tenderness.	C. gs.	Free fluid. Appendix injected, œdematous. Cæcum bound down by adhesions.	38	1
15	11	Excessive peristalsis.	Appendix not filling properly.	C. gs.	Multiple adhesions.	11	15
			Pyrexia and Vomiting (Three Cases).				
2	51	Gastric rate of emptying unduly rapid.	Fixed appendix. Cæcum tender. Concretions.	C. gs.	Appendix bound down by adhesions middle two-thirds. Fibrotic	51	2
11	6	No observations made.	Appendix never properly filled. Cæcum not movable. Tender.	C. gs.	Appendix bound down by adhesions. Constricted at proximal end. Fibrotic.	6	11
14	25	—	No evidence of appendix.	C. g.	Appendix under liver and gall-bladder. Very long, œdematous, injected; concretion in tip.	25	14
			Lassitude and General Malaise (Five Cases).				
5	25	No observations made.	Repeated marked tenderness at lower cæcal pole.	—	Long, kinked appendix. Considerable fibrosis.	25	5
12	18	Hyper-activity of duodenum.	Appendix not filling properly. Cæcum tender.	C. gs.	Adhesions. Abnormally long, very injected appendix containing purulent material. General œdematous mucosa. Submucous hæmorrhages.	18	12
3	25	Ptosis. Delay at pylorus. Gastric hypotony.	Appendix not empty four days after meal.	—	Appendix very long, fibrotic. Coiled on itself. Multiple adhesions.	25	3
9	12	Duodenum ? kinked second stage.	Appendix not empty 30 hours after meal. Irregular outline. Tenderness of cæcum.	C. gs.	Large, swollen, very injected appendix. Multiple submucous hæmorrhages.	12	9
13	37	Hyper-activity of duodenum.	Appendix only slightly filled.	—	Multiple adhesions. Appendix opaque and thickened with congested vessels.	37	13
			Lassitude and General Malaise and Upper Abdominal Discomfort (Eight Cases).				
10	27	Stomach hypotonic, dilated.	Appendix not seen.	—	Multiple adhesions around appendix.	27	10
6	20	Some dilatation of stomach, and gastric hypotonia.	Appendix filled, broken up. Cæcum tender.	C. g.	Appendix very œdematous. Multiple petechial hæmorrhages in mucosa. Distal one-third fibrotic.	20	6
4	27	Some ptosis. Moderate pause at pylorus.	Appendix not empty 3½ days after meal.	C. gs.	Long appendix, middle one-third filled with muco-pus. Terminal one-third fibrotic.	27	4
8	22	Duodenum fills at once. Second stage big and somewhat dilated. A little delay at duodenal-jejunal flexure.	Appendix kinked, irregular outline.	—	Appendix kinked at cæcum. Concretion in tip. Fibrosis of terminal one-third.	22	8
7	21	Rapid emptying of stomach.	Very little evidence of appendix.	C. gs.	Adhesions. Long fibrotic appendix filled with thick, almost solid fæces.	21	7
17	35	—	,, ,, ,,	C. gs.	Thickening and fibrosis of distal half of appendix.	35	17
16	16½	To and fro movement in duodenum.	Appendix partly filled. Only slightly movable.	C. gs.	Large, fat appendix, constricted in its centre.	16½	16
18	17	Fair amount of delay at pylorus. Some antiperistalsis is present in second stage of duodenum. Duodenum in second and third stages shows a little dilatation.	Fixed cæcum. Tenderness. Some barium in appendix 30 hours after meal.	C. gs.	Free fluid. Multiple adhesions. Appendix long, injected, œdematous proximal two-thirds, barium in distal one-third from meal given five days earlier.	17	18

C. gs. = calcareous glands.

deferred the operation for three months' medicinal treatment. During this period the patient had four weeks' holiday and continuous nervine and general tonics, particular attention being paid to the alleviation of his constipation. On May 3rd he reported continuous headaches. He slept like a log and awakened heavy-headed with a dry mouth. He had some flatulency. A fortnight later he reported awakening extremely heavy-eyed, with a nasty tangy taste in his mouth, so that he had to drink quantities of water first thing. On June 7th he developed a spread of small angry boils at the nape of the neck. On July 10th he had a further consultation with the surgeon, who agreed to perform appendicectomy.

The appendix was removed on July 31st. It was large, fat, and constricted in its centre. Four months later the patient had no evening fatigue, no headaches, and very slight flatulency. He was full of energy and had no disagreeable taste in his mouth. His general health had improved and he was less constipated.

CASE 18, a lad aged 17 years, felt "sickish" during the afternoon of Nov. 17th, 1930, and went to bed early. He had fitful sleep and awakened about 3 A.M. "feeling like death," and was violently sick. Physical examination showed marked increased resistance over the whole of the right rectus, particularly the upper segment, and increased resistance also in the left rectus. There was no pyrexia. After he had been in bed on milk diet and medicinal treatment for one week the upper two segments of the right rectus were still resistant. He had had occasional twinges of abdominal discomfort, and nausea for a short period on two occasions.

A barium meal on Nov. 26th showed the following abnormalities:—(1) A fair amount of delay at the pylorus. (2) some antiperistalsis in the second stage of the duodenum; (3) the duodenum at the second and third stages shows a little dilatation. 7½ hours after ingestion: (4) the cæcum lies an inch or two below the brim of the true pelvis; appendix not filled. 30 hours after ingestion: (5) some meal still in the appendix; (6) close to the appendix, calcareous glands are visible; (7) tenderness on palpation; (8) appendix is filled, but appears partly hidden by the cæcum and is not freely separated from it. The radiologist further reports: (9) "Cæcum fixed by adhesions caused either by calcareous glands or by the adherent appendix."

Appendicectomy was performed on Dec. 1st. Free fluid was found in the peritoneal cavity, and adhesions bound the cæcum to the posterior abdominal wall. The cæcum and ileum were very injected, and the appendix very œdematous in its proximal two-thirds; its distal one-third contained some barium from the meal given five days previously. There was an area of about 2 in. by ½ in. of inflammatory lymph on the terminal portion of the ileum and parietal peritoneum.

Conclusions.

Perhaps the two cases of outstanding importance to substantiate my claim for the recognition of the "poisoning appendix," and for appreciating the sequelæ suggested earlier, are Cases 13 and 18. Case 13 shows that a non-functioning appendix, as shown by X rays on March 21st, 1929, which had given toxæmic symptoms for two and a half years, had the pathological condition of the cæcal area altered, over a period of eight months, from one of a normal freely movable cæcum to one wherein the cæcum was bound down by adhesions, during which time the only clinical evidence was an intensification of the symptoms. In Case 18 we have definite evidence of physiological reaction in the upper abdominal tract with pathological changes around the appendix—viz., adhesions and calcareous glands—which must have been extant prior to nine days after a subacute attack; as well as operative evidence of the genuineness of the actual subacute attack.

Cases 1, 2, 11, 14, and 15, with histories of pyrexia and vomiting, but without any abnormal physical sign other than that described here for the first time, would be entitled to the convenient diagnosis of "gastric influenza." They suggest that this diagnosis has been made too freely, and that many cases so labelled have been really none other than a subacute exacerbation of the "poisoning appendix." One would be justified in stating that Cases 4, 6, 7, 9, 12, and 18 must inevitably have terminated in acute appendicitis with abscesses.

Cases 4, 6, 12, and 18 have the additional interest of all being in one family. In 1912 a baby belonging to this family died after an operation for appendix abscess and general peritonitis. Three months later another child had an attack of appendicitis. This attack was treated, and subsided, but kept recurring in subacute attacks until recently a chronically diseased appendix was removed. Furthermore, a son in this family had chronic appendicitis and duodenal ulcer; appendicectomy was performed during the period covered by this series. Yet again, the mother of the family and one other daughter also had appendicectomy, making a total of eight operations for appendicectomy within 22 months, four being for definitely chronic appendices, three for poisoning appendices, and one for poisoning appendix with subacute exacerbation.

One cannot overlook the importance of changes in the upper abdominal tract accompanying the non-functioning appendix. Twelve cases furnished this evidence.

Recognition of the "poisoning appendix" should considerably lower the surgical mortality in cases of appendicectomy, for a large percentage of cases would be operated upon before the predominance of peritoneal symptoms. It should also negative the disrespect with which physicians view operations for chronically diseased appendices; a disrespect begotten of the indisputable fact that in a large percentage of cases the patients appear to have derived no benefit at all from the operations. The probable explanation of this absence of beneficial results is that the patients' systems have become so impregnated with the by-products of poisoning from the appendix as to render removal of the cause incapable of obliterating the effects.

Investigations into the histories of patients with acute appendicitis have invariably shown that the patients complained of some phase of general malaise—which on close analysis would evidence toxæmic origin—over a period, either long or short, before the onset of acute symptoms. Acute appendicitis must, therefore, be regarded as a preventable calamity, not as a "bolt from the blue." Transition from physiological utility to pathological decay is slow but sinister, and leaves in its wake:—

(*a*) Symptoms of an absence of well-being, frequently indefinable but here classified as general malaise, and usually ineffectually treated by general tonics.

(*b*) The same general symptoms with upper intestinal tract symptoms superimposed.

(*c*) A physical sign described here for the first time; increased resistance of the upper segment only of the right rectus.

(*d*) Conclusive X ray evidence of the appendix not functioning properly.

Confirmation of the tentative diagnosis depends entirely upon the competence of the radiologist. It is unfortunate that the investigation is not within the reach of all. Were expense not a material factor, many more cases would have been investigated.

With one exception, all the X rays have been taken and reported upon by one radiologist, and with one exception all the operations have been performed by one surgeon, to both of whom I am very gratefully indebted.

STOURBRIDGE CORBETT HOSPITAL.—The Mayor of Stourbridge, Alderman H. E. Palfrey, last week cut the first sod of an extension, and was paid a wage of 1s. 1½d. for his spade work. The addition will provide 28 extra beds and the corresponding additional accommodation for nurses.

incapable of carrying on with his work without periods of rest. He had lost weight. In 1927 his condition was believed to be due to myocardial failure, but this opinion was negatived by the report of the cardiac specialist. Rest and tonics were prescribed. In October, 1928, he had some lower abdominal discomfort, and complained of constipation and of feeling the whole of the cæcum against the abdominal wall.

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2	51	Gastric rate of emptying unduly rapid.	Fixed appendix. Cæcum tender. Concretions.	C. gs.	Appendix bound down by adhesions middle two-thirds. Fibrotic	51	2
11	6	No observations made.	Appendix never properly filled. Cæcum not movable. Tender.	C. gs.	Appendix bound down by adhesions. Constricted at proximal end. Fibrotic.	6	11
14	25	—	No evidence of appendix.	C. g.	Appendix under liver and gall-bladder. Very long, œdematous, injected; concretion in tip.	25	14
			Lassitude and General Malaise (Five Cases).				
5	25	No observations made.	Repeated marked tenderness at lower cæcal pole.	—	Long, kinked appendix. Considerable fibrosis.	25	5
12	18	Hyper-activity of duodenum.	Appendix not filling properly. Cæcum tender.	C. gs.	Adhesions. Abnormally long, very injected appendix containing purulent material. General œdematous mucosa. Submucous hæmorrhages.	18	12
3	25	Ptosis. Delay at pylorus. Gastric hypotony.	Appendix not empty four days after meal.	—	Appendix very long, fibrotic. Coiled on itself. Multiple adhesions.	25	3
9	12	Duodenum ? kinked second stage.	Appendix not empty 30 hours after meal. Irregular outline. Tenderness of cæcum.	C. gs.	Large, swollen, very injected appendix. Multiple submucous hæmorrhages.	12	9
13	37	Hyper-activity of duodenum.	Appendix only slightly filled.	—	Multiple adhesions. Appendix opaque and thickened with congested vessels.	37	13
			Lassitude and General Malaise and Upper Abdominal Discomfort (Eight Cases).				
10	27	Stomach hypotonic, dilated.	Appendix not seen.	—	Multiple adhesions around appendix.	27	10
6	20	Some dilatation of stomach, and gastric hypotonia.	Appendix filled, broken up. Cæcum tender.	C. g.	Appendix very œdematous. Multiple petechial hæmorrhages in mucosa. Distal one-third fibrotic.	20	6
4	27	Some ptosis. Moderate pause at pylorus.	Appendix not empty 3½ days after meal.	C. gs.	Long appendix, middle one-third filled with muco-pus. Terminal one-third fibrotic.	27	4
8	22	Duodenum fills at once. Second stage big and somewhat dilated. A little delay at duodenal-jejunal flexure.	Appendix kinked, irregular outline.	—	Appendix kinked at cæcum. Concretion in tip. Fibrosis of terminal one-third.	22	8
7	21	Rapid emptying of stomach.	Very little evidence of appendix.	C. gs.	Adhesions. Long fibrotic appendix filled with thick, almost solid fæces.	21	7
17	35	—	,, ,, ,,	C. gs.	Thickening and fibrosis of distal half of appendix.	35	17
16	16½	To and fro movement in duodenum.	Appendix partly filled. Only slightly movable.	C. gs.	Large, fat appendix, constricted in its centre.	16½	16
18	17	Fair amount of delay at pylorus. Some antiperistalsis is present in second stage of duodenum. Duodenum in second and third stages shows a little dilatation.	Fixed cæcum. Tenderness. Some barium in appendix 30 hours after meal.	C. gs.	Free fluid. Multiple adhesions. Appendix long, injected, œdematous proximal two-thirds, barium in distal one-third from meal given five days earlier.	17	18

C. gs. = calcareous glands.

did the albuminuria disappear before delivery, in spite of active treatment.

It is difficult to understand how the widespread belief that albuminuria under treatment commonly clears up before the birth of the child has arisen, and I can only think that it is based upon careless observations, in which the albuminuria accompanying a transitory pyuria has been mistaken for an essential albuminuria. No case of albuminuria should be accepted unless a microscopical examination of the urine has been made for pus cells. It is sometimes difficult to decide how much albumin we may attribute to the presence of pus but this difficulty is uncommon, since a consideration of all the accompanying signs and symptoms will usually point to the correct diagnosis of either albuminuria of pregnancy or pyelitis or both. So long as the possible source of error is constantly borne in mind, error is unlikely; but immediately it is ignored mistakes in diagnosis and fantastic beliefs in "simple albuminuria" and "frequent cures" before delivery of the patient will inevitably result.

It is clear, therefore, that the majority of patients suffering from albuminuria must stay in bed from the very first time that albumin is discovered until after delivery. If we examine our treatment critically we cannot but be ashamed of our carelessness of end-results. That this carelessness is universal is shown by the fact that it is demonstrated in the annual reports of many of the big midwifery institutions of Great Britain. Under the section of albuminuria some of these reports have a heading showing the result of the urine test at the time the patient leaves hospital. In many cases the space is left blank (which possibly means that the urine was not tested), but where a record is made we can draw definite conclusions. Table V. is made up from the latest available annual reports of five of the hospitals where the necessary information is published.

TABLE V.

Total cases of albuminuria.	Result of urine test at time of discharge.		
	No record.	Alb. present.	No alb. present.
236	59	118	59

These hospitals have been chosen at random as representing the best type of treatment at present practised in Great Britain. It is seen, therefore, that in cases where a record is available nearly 70 per cent. of the patients are discharged from hospital before the albuminuria has cleared up. Some of these, no doubt, are suffering from chronic nephritis, but this can account only for relatively few cases. If the late results of albuminuria were satisfactory there might be some justification for allowing a patient with an acute renal disease to get up before all signs of disease had disappeared; but as in fact the present-day results are not satisfactory, surely there is reason to make an extra effort to improve them.

It is impossible to give any comparative figures showing the late results in patients who have, and have not, been allowed to leave bed before the albuminuria has disappeared, since it is too soon to have collected a large enough series of the latter. In the light of our present knowledge, the least we can do is to treat albuminuria of pregnancy with the care that we should bestow upon a case of acute nephritis. Except where there is good reason to believe that a chronic nephritis antedated the pregnancy, no lying-in mother who has suffered from albuminuria should be allowed to leave her bed until her albuminuria has entirely cleared up. This may be a counsel of perfection, and economic pressure amongst hospital patients may be a serious difficulty, but if we allow a patient to get up before this time, at least we must not delude ourselves that she is having the best treatment. The value of this rest is probably mainly that it reduces the patient's endogenous protein metabolism to a minimum, and therefore reduces the work that the damaged kidney has to do in excreting nitrogenous waste products.

Diet.

The importance of diet in the treatment of albuminuria has been stressed frequently enough, but unfortunately there is no uniformity of opinion as to the best diet to adopt, mainly because its value is differently interpreted by various observers. Admitting, as we must, our ignorance of the ætiology of "toxæmia of pregnancy," it seems unwise to adopt this or that diet because of some supposed influence in the production of an unknown toxin. The importance of renal disease, even though it be secondary in these cases, is undoubted, and since protection of renal function is an aim that can be furthered by dietetic measures it seems rational to adopt a diet which entails the least amount of work on the part of the kidneys.

This consideration has led me to adopt a diet that is as nearly as possible protein-free, and although I do not suggest that there is anything new in this type of diet, yet I would stress again that its adoption is based solely upon a recognition of the most important result of toxæmia of pregnancy—i.e., kidney damage. The diet is in no way dependent upon the possible cause of the toxæmia, and its "rationale" is uninfluenced by mere speculations into the ætiology of the disease.

A full mixed diet entails extra work for the kidneys for two reasons: first, on account of its specific dynamic action, it causes an increase in basal metabolism (especially marked where proteins figure largely in the diet) and this entails an increased excretion of nitrogen and salts; furthermore, in the case of nitrogenous foods, excess over and above the minimum necessary to replace the results of endogenous protein katabolism must be excreted quantitatively by the kidney. By diminishing the diet we can therefore diminish the work thrown upon the kidney, but this principle cannot be carried to the extreme of complete starvation, since in this condition the patient is forced to live on her own tissues to supply the needs for her basal metabolism, and thus immediately becomes carnivorous. It is therefore wrong in severe cases of albuminuria to enforce complete starvation. It should be our aim to supply as nearly as possible the basal caloric requirements of the body in a form of food which does not lead to any increase in work by the kidney. Such a food is sugar. A further advantage in adopting a sugar diet, as opposed to complete starvation, is that it avoids completely the onset of ketosis, a condition which is probably dangerous and certainly most distressing to a patient already severely ill with albuminuria of pregnancy.

Glucose is the sugar of choice, since it is less sweet than cane sugar, and for administration by mouth commercial "liquid glucose" (containing about 60 per cent. of carbohydrate) is perfectly satisfactory. A solution of 4 oz. of liquid glucose in a pint of water flavoured with lemon juice makes a lemonade which if not a pleasant drink, is at least tolerable; and it has the advantage that if four or five pints a day are consumed the patient receives about 1000 calories without imposing any extra work on her kidneys. Much less than this is, of course, sufficient to prevent a ketosis, but with this amount of glucose a tolerant patient can be starved of all other food for several days continuously. In practice it is found that alimentary glycosuria does not arise if the "lemonade" is distributed fairly evenly throughout the day. This is the minimum diet for the treatment of albuminuria, and it can be augmented by adding solid carbohydrates, then fats, and—in order to make the diet less uninteresting—a small amount of protein may be allowed as a concession, but the aim is to restrict diet as nearly as possible to carbohydrates.

The following standard diets are in use at Guy's Hospital, and they are given in detail to illustrate that a fairly attractive low protein diet can be achieved in hospital practice.

STAGE 1.—About 1000 calories. Lemonade and glucose four to five pints (glucose 4 oz. to the pint); oranges, 4.

STAGE 2.—About 1500 calories. Fluids not less than five pints (including glucose lemonade); oranges or apples, 4.

Breakfast.—Toast, 2 oz.; butter, ½ oz.; marmalade, 1 oz.; tea.

Lunch.—Cocoa or coffee.

Dinner.—Sandwiches (marmite, cress or lettuce, &c., 2 oz.); pudding, 4 oz.; jam, 1 oz.

Tea.—Bread, 2 oz.; butter, ½ oz.; jam, ½ oz.; tea.

Supper.—Biscuits, 1 oz.; cocoa.

STAGE 3.—About 1800 calories. Fluids and fruit as Stage 2.

Breakfast.—Toast, 2 oz.; marmalade, 1 oz.; butter, ½ oz.; tea.

Lunch.—Cocoa or coffee.

Dinner.—Sandwiches, 4 oz.; vegetables, ad. lib.; pudding, 4 oz.; jam, 1 oz.

Tea.—Bread, 2 oz.; sandwiches, 1 oz.; tea.

Supper.—Biscuits or sandwiches, 1 oz.; cocoa.

STAGE 4.—About 2200 calories. As Stage 3, with daily addition of half pint of milk; fish, 4 oz.; egg, 1.

In Stage 2 and Stage 3 milk is restricted to that necessary for beverages, since the protein content of milk is high, and it is allowed in these small amounts only in order to make the diet less dull for a patient who may have to confine herself to it for several weeks on end. Every patient, when first admitted to hospital, is put on Stage 1 diet for the first 24 hours in order to obtain an estimate of the blood pressure and albumin content of the urine under standard conditions. The subsequent diet depends upon a number of considerations but, generally, speaking, she remains on Stage 1 diet as long as her blood pressure remains high (above 150 mm.) or the amount of albumin in the urine is great (above 2 parts per 1000). Improvement beyond this stage is generally looked upon as cause for promotion to Stage 2 diet, and the patient then continues with this until she is delivered, except in the rare instances where the albuminuria clears up entirely before delivery, when she may proceed to Stage 3 diet.

Stage 3 diet is, as a rule, reserved for patients immediately after delivery, in whom it is still necessary to curtail the protein but in whom a fairly liberal diet is required to encourage lactation. Stage 4 diet is intended for patients who have recovered completely after delivery. When the last trace of albumin has disappeared from the urine the patient is allowed to get up and to enjoy this augmented diet. She is advised to keep to this as a rule for a further four to eight weeks, after which she is free from all restriction.

Elimination of Toxin.

While attempts to relieve the kidney of any excess of work are undoubtedly rational, we are on less certain ground when we attempt to "eliminate toxins" in cases of albuminuria. The very existence of a toxin is still unproven, and there is no direct evidence of how it is excreted. In spite of the absence of experimental proof, however, the clinical value of purgatives is well established, and in all cases it is important to secure one or two loose evacuations of the bowels daily. This is best achieved by saline purgatives, and magnesium sulphate in doses of 2 drachms should be given as required; usually once daily is sufficient. The one disadvantage of this régime is that after some time (four to eight days) the patient may become uncomfortable from abdominal distension due to the prolonged continual administration of magnesium sulphate. This can be overcome by giving 48 hours' rest from the saline aperient and substituting for it small doses of cascara sagrada, after which the saline can be continued for a further period.

The advisability of inducing diaphoresis has been questioned, since it is held by some that the loss of fluid in this way merely concentrates the toxins in the body. As there is no experimental evidence to help us we are compelled to rely on clinical impressions for guidance, and it has been repeatedly observed that in cases of severe toxæmia profuse sweating is usually a good sign. For this reason, in severe cases of albuminuria where there is threatened suppression of urine, it is advisable to induce sweating by means of hot blankets, or, if available, by an "electric cradle," but it is not necessary to make use of diaphoresis in less severe cases.

The possible excretion of toxins by way of the kidneys calls for the administration of large amounts of fluid, and in any case, even if the intake of fluid is not followed by a commensurate diuresis, it must result in a dilution of toxins in the body. Clinically, the result of ingestion of large amounts of fluid are certainly good. For this reason the patient should be encouraged to drink at least five pints a day. On Stage 1 diet this will necessitate her taking a pint of water in addition to her four pints of "glucose lemonade." On the other diets she may choose her fluid from water, barley-water, lemonade, and other similar beverages.

Drugs.

With the possible exception of alkalis, there are no drugs of any particular value in the treatment of albuminuria, apart from those necessary for the production of catharsis. Osman and Close,[2] in their general study of renal disease, have drawn attention to the value of large doses of alkalis in the treatment and prevention of nephritis, and have suggested the use, inter alia, of alkalis in the treatment and prevention of albuminuria of pregnancy. As is now well known, Osman's "alkali treatment" is a very different thing from giving a fixed dose of potassium citrate to a patient three times a day, and its application involves careful and constant observation on the pH of the urine, with occasional control estimations of the bicarbonate reserve of the blood. In his view, the employment of inadequate doses of alkali is useless. While the results of Osman's investigations into the value of alkalis in albuminuria of pregnancy are as yet incomplete, it is too soon to attempt to form an opinion on this line of treatment. We must wait until sufficient evidence has been obtained to warrant either its adoption or its omission from the methods at our disposal. Irresponsible dabbling with alkalis can lead to no good.

Induction of Labour.

When conservative methods have failed in the treatment of albuminuria associated with pregnancy, there is general uniformity of opinion that induction of premature labour should be adopted as a radical measure. Much difference of opinion exists as to when conservative treatment is to be considered a failure. In the light of our knowledge of the remote effects of this disease on the kidneys, we must look upon the conservative treatment as a failure if eclampsia supervenes, if chronic nephritis results, and also if the patient develops an albuminuria with a subsequent pregnancy in spite of being apparently healthy in the interval. Furthermore, if the fœtus dies in utero, conservative treatment has obviously failed in its object.

Unfortunately, induction of labour does not offer a solution to the difficulties in every case, but it is a measure which deserves a wider application than it has been given in the past. It was formerly considered valuable only in so far as it might prevent the onset of eclampsia, but now that the other sequelæ of albuminuria are recognised, there is good reason to expect that improvement in the late results of pregnancy toxæmia will follow the wider use of induction of premature labour in certain cases.

Attention has been drawn already to the fact that the incidence of recurrent albuminuria can to some extent be controlled by early induction of labour in the first toxæmic pregnancy, and also that the incidence of chronic nephritis amongst previously healthy women can be appreciably diminished by the same means. So far as the welfare of the child is concerned it has been shown that maceration owing to delay in induction is in fact a greater danger than the risk of death from prematurity resulting from induction.

Armed with these facts, we can proceed to consider general principles as to the indications for induction of premature labour in cases of albuminuria. These indications can never become hard-and-fast rules, since the relative importance placed upon the value of the infant and the risk to the mother must vary with each individual patient, but they are to be taken as a working basis, to be modified in special circumstances. They can be set out as follows.

Labour should be induced:

1. In any severe toxæmia (blood pressure greater than 170 mm.) which does not respond within 2 or 3 days to full treatment—i.e., rest in bed on Stage 1 diet.

2. In any toxæmia of moderate severity (blood pressure 150 mm.) when progressive improvement ceases to take place. It is not sufficient that the blood pressure and albumin content of the urine should remain constant from day to day to justify the withholding of induction.

3. In any toxæmia, no matter how mild, that has lasted (as proved by the persistence of albuminuria) more than two weeks.

4. In patients known to have a chronic nephritis, as soon as the patient is first seen.

5. In any case where a previous pregnancy has resulted in a macerated fœtus, as soon as the fœtus seems big enough (32 to 34 weeks) to stand a reasonable chance of survival.

It must be emphasised again that these indications are to be modified in special cases, but they are set out dogmatically as a standard that we should try to attain for the sake of the mother. It may, in special circumstances, be justified to allow her to take risks of permanent renal damage for the sake of a viable fœtus, but let us not delude ourselves about the issue. Delay in induction may be necessary for the sake of the fœtus in some cases, but it is the mother who pays for this advantage. That she may pay willingly is no reason for belittling the cost.

Summary.

In view of the unsatisfactory results that are liable to follow upon albuminuria complicating pregnancy, the necessity for more whole-hearted treatment has been stressed. The futility of basing a treatment upon mere speculations as to the ætiology of the disease has been discussed, and a treatment the rationale of which depends upon what we know of the late results has been outlined. This treatment aims primarily at protecting the kidneys against the "toxæmia," and it has as its basis, rest, protein-free diet, and early induction of labour. These three measures are discussed at length, and although each is a well-recognised method of treatment, a plea is made for their more conscientious application, in an attempt to improve the late results which are at present so unsatisfactory.

References.—1. Gibberd, G. F.: Proc. Roy. Soc. Med., 1928, xxi., 831. 2. Osman, A. A., and Close, H. G.: Ibid., 1931, xxiv., 880.

THE ANTIRACHITIC VALUE OF IRRADIATED YEAST.

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The results of the administration of irradiated yeast to rachitic children have been reported in a previous communication.[1] The present paper deals with the evaluation of the antirachitic potency of irradiated yeast by means of the rat test.

It is well known that, owing to the easy storage of vitamin D, unknown variable amounts of this factor are present in the body of young rats when placed on a rachitogenic diet, and that the time necessary for the production of rickets is a function of the maternal diet. Similar difficulties are encountered in the case of vitamin A. To obviate them Nelson[2] has recently suggested a simple and ingenious procedure. He found that, when mother and young were transferred to a vitamin-A-free diet when the young were 16 to 18 days old, the onset of symptoms of vitamin A deficiency in the young seemed to be independent of the amount of vitamin A given to the mother during the entire period of lactation. Some difficulties having been encountered in our laboratory in the production of rickets in young rats when transferred directly from the stock diet* to the rachitogenic ration, the method of Nelson was resorted to with excellent results. On the 16th day of lactation mother and young were changed from the stock diet to a similar diet from which the butter had been omitted; the young were weaned when weighing from 55 to 65 g. and placed on the 2965 rachitogenic diet of Steenbock. In every case line test rickets were produced with great constancy in the course of three weeks.†

The irradiated yeast was prepared under exactly the same conditions as previously described.‡ For testing, graded amounts of the yeast were weighed out, intimately mixed with 50 g. of diet 2965 and fed to rachitic rats which were kept in separate cages. When completely consumed, the mixture was followed by the untreated 2965 ration, and after ten days the rats were killed, and the radii and ulnæ examined by the line test technique.§ Amounts from 1 to 20 mg. of irradiated yeast were tested and the results are shown in Figs. 1 and 2. As appears from the drawings, a total dose of 1 mg. (or 0·1 mg. daily) is sufficient to produce a narrow line of calcification, and is therefore equivalent to one rat unit as defined by Steenbock. This is in perfect agreement with the results of Steenbock,[5] a result certainly striking, especially as the yeast used in Madison and Warsaw respectively was obtained from quite different sources, and the conditions of irradiation were not exactly the same in the two places.

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* The diet was a modification of Steenbock's stock diet[3] and had the following composition: whole ground rye 70, linseed cake 15, butter 5, dried ox liver 3, calcium carbonate 0·5, sodium chloride 0·5. The diet was supplemented with 10 per cent. by weight of dried whole milk and fresh carrots.

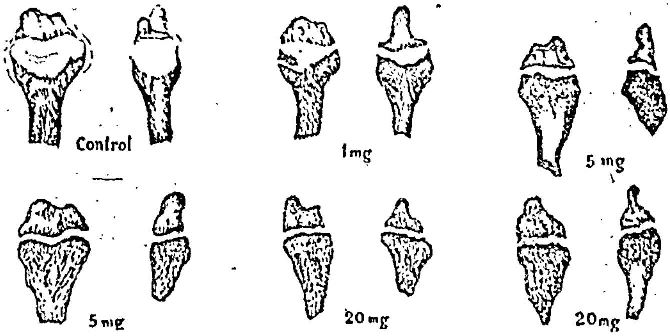
† According to the "tests" of the Pharm. Soc. of Gt. Brit.[4] butter should be omitted from the diet of mothers whose young are to be used for vitamin D tests.

‡ By inadvertance the distance from the source of light was not given in the first paper. The distance was 50 cm.

Stability of Vitamin D in Irradiated Yeast.

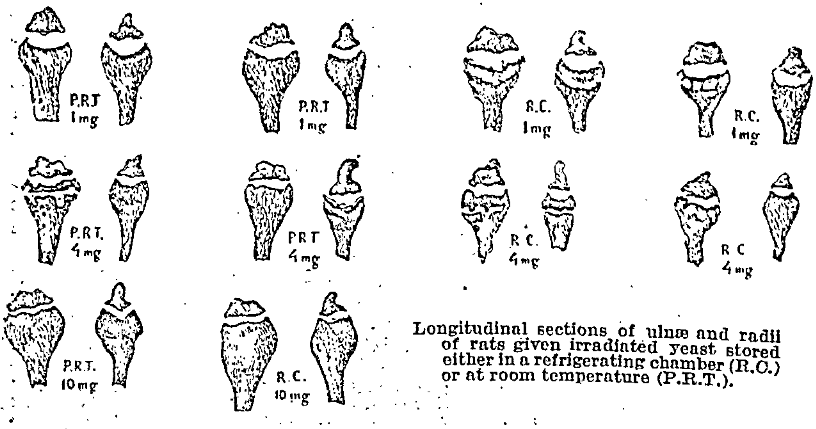
A batch of yeast irradiated under standard conditions on Nov. 19th, 1929, was divided into two parts: one was placed in a glass-stoppered bottle in a cold store at a temperature of −2° C., the other, wrapped in paper, was kept at room temperature in the laboratory. After six months (on May 21st, 1930) the two preparations were tested for their vitamin D content. The results are given in Fig. 3. It is evident that no difference can be noticed between the activity of the two batches. There is no separate line of calcification in the case of rats given 1 mg. of P.R.T. yeast—but the width of the metaphysis approximately corresponds with a "narrow line" test. A comparison with Figs. 1 and 2 shows that hardly any loss of activity took place in the course of six months, 1 mg. of irradiated yeast still giving after this time a narrow line of calcification or a medium metaphysis.

FIG. 2.



Longitudinal sections of ulnæ and radii of rats given irradiated yeast.

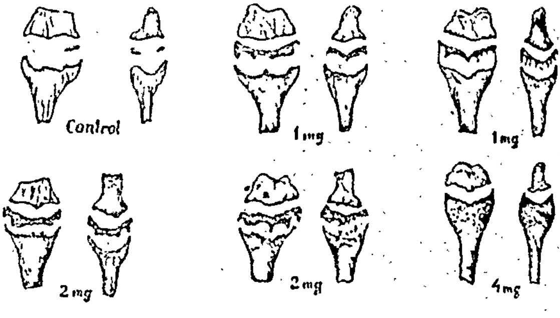
FIG. 3.



Longitudinal sections of ulnæ and radii of rats given irradiated yeast stored either in a refrigerating chamber (R.C.) or at room temperature (P.R.T.).

The batch kept at room temperature was retested after another four months had elapsed (ten months after irradiation) on Sept. 23rd, 1930, and no noticeable deterioration was observed, 1 mg. of the preparation still giving a narrow line. These drawings are omitted in order to save space.

FIG. 1.



Drawings of longitudinal sections of ulnæ and radii (treated with silver nitrate and exposed to light) of rats given irradiated yeast.

The results indicate that irradiated yeast retains for a long time its antirachitic properties and that it can be kept at ordinary temperature and exposure to air. This is in contradiction to the results of Kirsch,[6] who found that irradiated yeast rapidly deteriorated. He must have been working, however, with an inadequate preparation, for he had to administer very high doses (0·5 to 1 g. daily) in order to obtain positive results.

Problem of Overdosage.

The question whether untoward symptoms observed in infants and in experimental animals receiving an overdosage of irradiated substances is due to hypervitaminosis or is caused by a toxic factor distinct from the vitamin has not yet been answered with certainty.[7 8 9] It is obvious that the irradiation of such a complex substance as yeast, in the presence of oxygen and with polychromatic ultra-violet light, leads to the formation of a variety of products other than vitamin D. On the other hand, some observers have voiced the opinion that non-irradiated ergosterol is per se harmful.[10] Should this be true, it might have an important bearing on the use of yeast in general and of irradiated yeast in particular, for there is no doubt that a large percentage of unchanged ergosterol is present in irradiated yeast. It was thought highly necessary to determine experimentally whether and what overdosage of irradiated yeast would be harmful to the rat.

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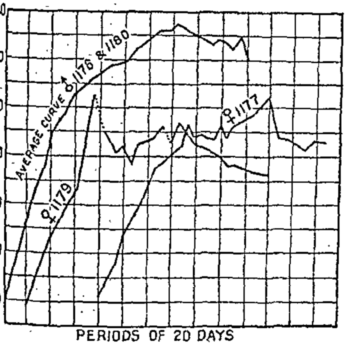
§ The author had the privilege of spending six months in the laboratory of Prof. Steenbock and of acquiring the technique of the line test, as carried out there.

Twelve rats from two litters were therefore distributed into three batches, each batch consisting of two males and two females, with the exception of batch 1, containing three males and one female. The first batch was placed on our usual stock diet (diet 33), the second was given the stock diet plus an addition of 10 per cent. of non-irradiated yeast (diet 57), while the third batch was given the stock diet with an addition of 10 per cent. of irradiated yeast (diet 58). In each batch the males and females were kept together; pregnant does were isolated; in each litter the young after birth were reduced to six, weaned in the customary way when three weeks old and transferred, males and females together, to separate cages, where they were offered the parental diet. The experiment lasted 6½ months (200 days). During this time one female on diet 57 (non-irradiated yeast) had two litters but did not suckle them‖; the other female had four litters (35 young) of which three were suckled after reduction of the litters to a maximum of six, and seventeen young were weaned. On diet 58 (irradiated yeast) one female had two litters, one of nine young and one of two; after reduction of the former all eight were weaned. The other female had no litter, but normal fœtuses were found in utero at autopsy at the close of the experiment.

FIG. 4.



Growth curves of first generation rats on diet containing irradiated yeast.

FIG. 5.

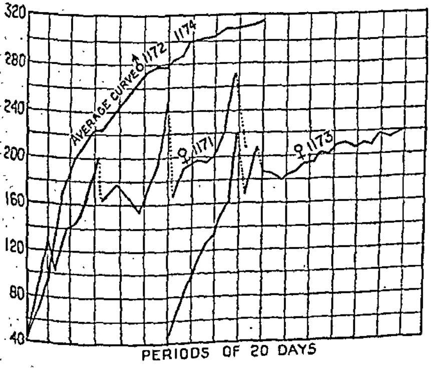
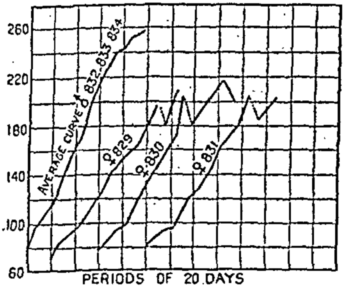


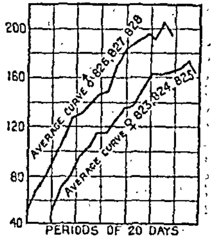
FIG. 6.



Growth curves of first generation rats (Fig. 5) and second generation rats (Fig. 6) on diet containing non-irradiated yeast.

The growth curves are given in Figs. 4 and 5 and it can be seen that while the animals on diet 57 grow steadily, those on diet 58 reached a plateau in the later part of the experiment, and then declined slowly. The differences are, if anything, more marked in the second generation, as shown by the growth curves of the first litters of does 1171 (diet 57) and 1179 (diet 58), Figs. 6 and 7. The better growth of the rats receiving non-irradiated yeast is clearly evident.¶

FIG. 7.



Growth curves of second generation rats on diet containing irradiated yeast.

On inspection at the close of the experiment they were found to be strong and lively animals, with silky fur and excellent muscular tonus, while the rats receiving irradiated yeast looked rather old for their age, felt flabby, the coats were not good, and the nose, front paws and the fur were to a greater or lesser degree soiled with blood. All three second generation females on the non-irradiated yeast (first litter of doe 1171) produced litters, and two weaned them successfully, while none of the second generation females on the irradiated yeast bore young. The reason for this failure is not clear, as motile sperm was found at autopsy in all the males and, by means of vaginal smears, ovulation was shown to occur in the females.

In an elaborate research Bills and Wirick[13] have reported definite injury in long-time experiments in rats receiving 4000 times the minimum antirachitic level of irradiated ergosterol, and they state that "All the females failed to reproduce following the third mating." A similar reproductive failure of rats receiving 50,000 times the normal daily dose of irradiated ergosterol, in addition to the Bills' modification of the Steenbock stock diet, was reported by Light, Miller and Frey.[13]

‖ Failures in lactation occurred also in stock colony females. This phenomenon has been discussed in a separate communication.[14]

¶ Curves for other second-generation rats are not given for economy of space. A second litter of five of doe 1171, born 2½ months before the termination of the experiment, grew at a perfectly normal rate, and the rats were apparently quite healthy and strong when disposed of. A third litter of six was weaned on the day the experiment was discontinued and averaged 46½ g. at that time. The second litter of doe 1179, consisting of two females, was unfortunately used for another experiment immediately after weaning.

Third generation young from the non-irradiated yeast group were apparently perfectly normal at weaning, when they were killed, it being necessary to discontinue the experiment. As mentioned, third generation young were not produced in the irradiated yeast group. The average daily food intake being estimated at 15 g. every rat must have consumed about 1·5 g. of yeast daily, corresponding, for the irradiated yeast animals, to an intake about 15,000 times larger than the minimal daily dose necessary for the production of a positive line test in a rachitic rat. The toxic effects of such an overdose are quite definite, but they are slight when compared with the dramatic course of massive overdosage with irradiated ergosterol. It seems that it may safely be concluded that irradiated yeast is not more toxic for rats, unit for unit, than irradiated ergosterol.

The results obtained do not seem to indicate that non-irradiated ergosterol, at least in the concentrations used in the present work, has any toxic properties. In fact rats receiving the addition of 10 per cent. of non-irradiated yeast did just as well as their mates on the stock ration alone. This observation is at variance with the findings of Jundell,[10] but certainly more work will have to be done on this important question before it is definitely settled.

Summary.

Yeast irradiated under specified conditions was found to contain one rat unit (Steenbock) in 1 mg. The preparation is stable and retains its potency for at least ten months at room temperature. A toxic effect could be elicited in rats by the prolonged administration of a modified Steenbock stock diet containing 10 per cent. by weight of irradiated yeast.

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HIGHER PAYMENTS TO CONTRIBUTORY SCHEMES.—The board of delegates of the Birmingham Hospital Saturday Fund has unanimously agreed to raise the weekly contribution from 2*d.* to 3*d.*, after a proposal to graduate the payment according to income had been narrowly defeated.—The Sheffield and District Association of Hospital Contributors has also decided "to make an extra voluntary contribution at a flat rate of 1*d.* per week for an agreed period."

CORBRIDGE MATERNITY HOSPITAL.—Last week Lady Victoria Percy opened a maternity hospital at Corbridge, provided by the Northumberland County Nursing Association. The hospital consists of a considerably enlarged private house which has been used as a nurses' home by the Tynedale district nurses. In addition to a public ward there is a private ward and accommodation for private nurses. One of the wards is a memorial to the late Dr. Daniel Jackson, of Corbridge.

INSULIN AND PRESERVATIVE.

NOTE ON THE EFFECT OF INSULIN SOLUTIONS OF VARYING REACTION ON THE VIABILITY OF STAPHYLOCOCCI.

By PERCIVAL HARTLEY, M.C., D.Sc.

(From the National Institute for Medical Research.)

THE question of the addition of preservatives to insulin preparations dispensed in certain types of containers has been discussed recently in the correspondence columns of THE LANCET.[1,2,3,4] It is not proposed to enter into all the points raised in this correspondence; some of the writers assert definitely that the frequent daily injections of small amounts of phenolic preservative is harmful, while others are less positive, and urge, rather, that certain aspects of the question should receive further consideration and investigation. In view of recent experiences with antiseptic-free preparations of other therapeutic substances, it appeared to be of some importance to ascertain whether insulin solutions without such preservative can serve as a culture medium for micro-organisms accidentally introduced, and the importance of the question is increased by the fact that a great deal of the insulin used is administered by the patient himself. Is it possible for the diabetic patient, by any accident likely to occur in practice, to infect his phial of insulin at one withdrawal of a dose and, if he does so, will there be a danger of his injecting living micro-organisms in a later dose from the same bottle? It seemed desirable to investigate, firstly, whether micro-organisms can survive or multiply in the solutions of insulin as supplied; and, secondly, if these solutions are themselves germicidal, whether it is possible by accidental introduction of a small quantity of alkaline fluid to make the solution a culture medium for micro-organisms.

EFFECT OF REACTION ON BACTERIAL GROWTH.

It is claimed that the acidity of insulin solutions is a sufficient protection against infection, and this claim, together with the experience gained in this Institute, especially in the period immediately following the introduction of insulin, suggested that this particular point merited further investigation. During recent years samples of insulin have been returned to this Institute with a complaint that the product has become opalescent or that a precipitate has appeared in the fluid. Examination showed that the opalescence or precipitation was due, not to infection with micro-organisms, but to the fact that the reaction of the fluid had been changed so as to approach the isoelectric point of the insulin. Manufacturers of insulin have had a similar experience, and it is very probable that the cause of the opalescence or precipitation was the use of syringes which had been sterilised in alkaline solutions. Leyton and Poulton,[1] having in mind this possibility, suggest that an additional precaution might take the form of an instruction to the patient to the effect that, if the insulin does not look like clear water, it should not be used. The adoption of this proposal would exclude from further use some of the solutions which have been shown in these experiments to be capable of supporting the growth of staphylococci; but it has been found also that solutions of insulin which have been made sufficiently alkaline to overshoot the isoelectric point, so that they remain water-clear, certainly permit the survival, and possibly support the growth, of staphylococci.

Through the courtesy of three of the British manufacturers, samples of insulin have been supplied which are similar in all respects to their ordinary batches, with the single exception that the usual phenolic preservative had not been added. These samples are referred to below as B1 (32 units per c.cm.), B2 (20 units per c.cm.), and B3 (20 units per c.cm.). A preparation of preservative-free insulin made by a foreign manufacturer has also been available, and this is referred to as L (40 units per c.cm.); and one further sample for study, kindly supplied by this foreign manufacturer, was a preparation of the same insulin, L, containing 0·3 per cent. of tricresol.

As test organism a strain of *Staphylococcus albus* has been used. This has been subcultured daily into 10 c.cm. quantities of nutrient broth, and 24-hour old cultures have been used throughout the work. The dilutions of the culture have been made in nutrient broth, and in all the experiments the cocci inoculated into each insulin sample (5 c.cm. quantities of insulin solution being used throughout) were contained in 25 c.mm. of the appropriate dilution. In each experiment the number of cocci inoculated was determined.

For the purpose of varying the reaction of the 5 c.cm. quantities of insulin solution under test, a sodium carbonate solution was prepared by dissolving 0·84 g. of sodium bicarbonate in 100 c.cm. of distilled water, the *solution being distributed, in* 5 c.cm. quantities, into test-tubes, which were then autoclaved. It was found that the addition of 0·2 c.cm. of this solution to 5 c.cm. of the insulin preparations used brought the reaction of the fluid to about pH 8.

RESULTS OF THREE EXPERIMENTS.

EXPT. 1.—From each of three of the insulin solutions, B1, B2, and L, duplicate 5 c.cm. quantities of insulin were measured out, and to one of each pair of tubes 0·2 c.cm. of the alkaline solution were added. The precipitate which first formed redissolved. To each of the six tubes 920 staphylococci were added, and the mixtures allowed to stand at room temperature for 48 hours. At the end of 24 hours, and again at the end of 48 hours, the number of viable cocci present in each tube, and the pH, were determined. The reaction of insulin solutions as prepared for use is between pH 3–4. The addition of 25 c.mm. of broth used for the inoculum *has a slight effect on the reaction,* the pH of all the solutions tested being about 4, or slightly more alkaline (Table I.).

TABLE I.

Preservative-free insulin.	Alkali solution added c.cm.	pH.	Number of cocci present after—	
			24 hours.	48 hours.
B1	Nil.		0	0
	0·2	8	0	0
B2	Nil.		0	0
	0·2	7·8	800	1200
L	Nil.		0	0
	0·2	7·8	14,000	Unc.

Unc. = uncountable.

EXPT. 2.—This was carried out in the same way as the previous experiment, except that: (1) The insulin-cocci mixtures were incubated at 37° C. for 24 hours and then allowed to stand at room temperature for a second 24 hours. (2) Gradually increasing quantities of the alkali solution were added to the 5 c.cm. samples of preservative-free insulins, B1 and L. The amount of material of preservative-free insulins B2 and B3 available was only sufficient for the single test quoted. (3) The number of cocci inoculated into each sample was 200 (Table II.).

EXPT. 3.—In this experiment the preservative-free insulin L and insulin L containing 0·3 per cent. tricresol were compared. Each tube was inoculated with 2200 cocci, and the mixtures were kept at room temperature throughout the 48 hours of the experiment (Table III.).

TABLE II.

Preservative-free insulin.	Volume of alkali solution added c.cm.	Appearance of solution.	pH.	Number of cocci present after—	
				24 hours at 37° C.	Second 24 hours at room temp.
B1	Nil.	Clear.		0	0
	0·1	M. op.	7	19,200	84,000
	0·2	Ft. op.	8	600	1000
	0·3	Clear.	8·5	0	0*
	0·4	,,	8·8	0	0*
B2	Nil.	,,		0	0
	0·2	,,	7·8	4,000	400
B3	Nil.	,,		0	0
	0·2	,,	8·2	5,000	1,400
L	Nil.	,,		0	0
	0·1	H. prec.	6·5	Unc.	—
	0·2	Ft. op.	7·8	,,	—
	0·3	Clear.	8·3	14,800	1,600
	0·4	,,	8·8	1,400	0*

M. and Ft. op. = markedly or faintly opalescent; H. prec. = heavy precipitate.

* After 48 hours, 0·1 c.cm. of these solutions were inoculated into 10 c.cm. quantities of nutrient broth; no growth occurred after three days' incubation at 37° C.

TABLE III.

Insulin L.	Volume of alkali solution added c.cm.	Appearance of solution.	pH.	Number of cocci present after—	
				24 hours.	48 hours.
I.	Nil.	Clear.		0	0
	0·05	Op.	4·5	0	0
	0·1	H. prec.	6	22,800	200,000†
	0·2	Very ft. op.	8	4,500	8,500
	0·3	Clear.	8·5	600	0*
	0·4	,,	8·8	0	0*
	0·5	,,	9·2	0	0*
II.	Nil.	,,		0	0
	0·05	Ft. op.	4·5	0	0
	0·1	H. prec.	6·3	0	0
	0·2	Very ft. op.	8	0	0
	0·3	Clear.	8·5	0	0
	0·4	,,	8·8	0	0
	0·5	,,	9·2	0	0

* See Table II. † Over.

I. = Preservative-free. II. = Containing 0·3 per cent. tricresol.

COMMENT.

Leyton and Poulton[1] raise the question as to whether an ordinary solution of insulin is a suitable *culture medium, and these experiments show that,* with the number of cocci used, such solutions are germicidal. In this respect the results are in complete agreement with those of Payne and Signy,[3] who showed that *B. coli* and *Staphylococcus aureus* failed to survive in insulin solutions of the usual acidity. The result is in accordance with expectation and with clinical experience; it is clear that, provided the normal acidity of insulin solutions is maintained, the danger of infection from casually introduced micro-organisms is not serious. It is shown in Experiment 3 that, even if the insulin solution becomes inadvertently neutralised, the presence of the usual proportion of phenolic preservative suffices to kill cocci which may be accidentally introduced.

If the normal acidity of an insulin solution containing no preservative is even slightly reduced, however, staphylococci are not killed by it, and under certain conditions considerable growth may occur. The range of reactions to the alkaline side of pH 6, in which multiplication was observed, differed in the case of different insulins, presumably on account of slight differences in their content of substances, other than insulin itself, which are capable of supporting bacterial growth. The widest range, as it happened, was observed in the case of the insulin which is usually issued without preservative. At a definitely higher reaction, higher with some samples than others, the solutions again became not merely incapable of supporting growth, but apparently coccicidal. For this action of the more alkaline insulins no explanation is offered at present, but it is hardly of practical interest for the present purpose. The important conclusion from these experiments is that an insulin solution may be made into a culture medium by a slight addition of alkali, if no preservative is present.

CONCLUSIONS.

(1) Insulin solutions, with the acidity commonly given to them (pH 3–4), have a germicidal action even when no added preservative is present. (2) A slight change in the reaction towards the alkaline side not only destroys this germicidal action, but converts the solution into a culture medium if no preservative is present. The usual proportion of phenolic preservative is still effectively germicidal under such conditions. (3) Opalescence or turbidity of the solution is not an adequate indication of such change of reaction. Solutions can be made sufficiently alkaline as to remain clear and still support the growth of cocci.

I record my indebtedness to my colleague, Capt. S. R. Douglas, F.R.S., for his help and advice during these experiments.

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OBSERVATIONS ON THE PRODUCTION OF ANTIPOLIOMYELITIS SERUM IN HORSES

AND THE DISTRIBUTION OF THE ANTIBODY AMONG THE SERUM FRACTIONS.

BY R. W. FAIRBROTHER, M.D. MANCH.,

AND

W. T. J. MORGAN, M.SC., PH.D. LOND., F.I.C.

(From the Milbank Research Fund, the Bacteriological Department, Lister Institute, London; and the Serum Department of the Lister Institute, Elstree.)

WE have elsewhere recorded [1] the development of antiviral properties in the serum of one or two horses hyperimmunised by the intramuscular route with living potent poliomyelitis virus of monkey origin. The neutralisation tests with the serum revealed an activity comparable with that of human or monkey convalescent serum. The complete failure with the second horse raised again the question whether natural insusceptibility to infection with a particular virus necessarily precluded the production of antiviral bodies in response to hyperimmunisation, and it appeared desirable to attempt the immunisation of other horses.

Two additional horses were therefore given a course of intramuscular inoculations similar to that described in our earlier communications. In the hope of obtaining a potent antiviral serum in a shorter time an unfiltered emulsion of the virus-containing nervous tissue was used for the preliminary inoculations. The occurrence of severe anaphylactic-like reactions in the horses, however, forced us to continue the immunisation with the original filtered virus preparation. After both horses had received a total of 250 c.cm. of the filtered 10 per cent. virus emulsion a sample bleeding was taken, and tests were made with the serum samples to determine whether the serum had acquired any specific antiviral properties. The neutralisation tests were performed in the following manner: a mixture of the potent virus and the serum was allowed to stand in vitro at 37° for 1½ to 2 hours and left overnight at 4° C., after which time 0·5 c.cm. was injected intracerebrally under ether anæsthesia into *Macacus rhesus* monkeys.

RESULTS OF EXPERIMENTS.

The results indicated a marked difference in the protective power of the serum samples from the two horses; in one case, horse H3, this was very poor, whereas in the other horse, H4, the serum possessed marked antiviral properties.

TABLE I.—*Horse H4. Final Bleeding* (7.xi.30).

Mixture inoculated. 0·2 c.cm. 5 per cent. virus emulsion, together with—	Animal No.	Result.
0·05 c.cm. saline, 0·25 c.cm. serum	M458	0
0·20 „ „ 0·10 „ „	M459	0
0·25 „ „ 0·05 „ „	M460	0
0·25 „ „ 0·05 „ „	M476	0
0·275 „ „ 0·025 „ „	M477	0
0·275 „ „ 0·025 „ „	M491	0
0·285 „ „ 0·015 „ „	M492	0
0·285 „ „ 0·015 „ „	M498	0
0·295 „ „ 0·005 „ „	M493	0
0·295 „ „ 0·005 „ „	M499	0*
0·2975 „ „ 0·0025 „ „	M500	† (8 days)
Virus control { Mixture inoculated. 0·2 c.cm. 5 per cent. virus emulsion, together with 0·3 c.cm. saline.	M421	† (5 days)
	M474	† (4 „)
	M494	† (6 „)
	M497	† (4 „)

0 = animal remained quite well.
* Died T.B. nineteenth day.
† =paralysis and death, with the length of the incubation period in parentheses.

The serum of each of the horses collected before the inoculations commenced had not the slightest neutralising effect on the activity of the virus. After a rest period of six weeks further inoculations, amounting to 1100 c.cm. of the filtered 10 per cent. virus emulsion, were given to the horse H4. A large bleeding was then taken, and the separated serum tested for antiviral activity. The results of the neutralisation tests are shown in Table I. It is seen that the serum was extremely active, for 0·005 c.cm. completely neutralised the test dose of virus, which was estimated to contain at least 100 minimal infective doses.

In a previous communication [2] on the concentration of the protective substance in antipoliomyelitis serum it was shown that the protein which was precipitated at a relatively low concentration of ammonium sulphate was uniformly much more potent in antiviral action per unit weight of protein than that precipitated with higher concentrations of this salt. These experiments on the potency of the various protein fractions have been repeated by fractionating the potent immune serum from horse H4. The methods of preparing and testing the antiviral activity of the various fractions have already been described, and need not be repeated. The results are shown in Table II. Each animal received 0·2 c.cm. of a 5 per cent. virus emulsion, together with the amount of the protein fraction shown in the third column; in all cases the amount inoculated was 0·5 c.cm.

It will be seen that the protein which was thrown out of solution on dialysis possessed potent antiviral properties, since 0·017 mg. completely neutralised the test dose of virus. Both the pseudoglobulin and albumin fractions possessed some power to neutralise the virus; 0·23 and 0·49 mg., respectively, of these latter fractions completely neutralise the test dose.

TABLE II.—*Serum Fractions.*

Method of preparation.	Mg. protein.		Monkey.	Result.
	Per c.cm.	Per dose.		
Dialysis (euglobulin fraction) ..	3·5	0·087	M520	0
	3·5	0·043	M521	0
	3·5	0·017	M531	0
	3·5	0·0086	M537	† (6 days)
	3·5	0·0034	M538	† (9 „)
Salting-out with ammonium sulphate 36 to 50 per cent. (pseudoglobulin fraction) ..	46·5	1·16	M522	0
	46·5	0·58	M523	0
	46·5	0·23	M532	0
	46·5	0·115	M539	† (12 days)
	46·5	0·046	M540	† (7 „)
Ditto, 50 per cent.—saturation (albumin fraction) ..	35·5	0·89	M524	0
	35·5	0·49	M525	0
	35·5	0·18	M533	† (12 days)
Virus controls	Mixture inoculated. 0·2 c.cm. 5 per cent. virus emulsion, together with 0·3 c.cm. saline.		M515	† (5 days)
			M516	† (6 „)
			M541	† (4 „)

These results support the conclusions reached in our previous communication, that an antiviral preparation of high concentration can be obtained by collecting the so-called "euglobulin" fraction and dissolving it in saline. The results recorded in our previous paper indicated a general distribution of the antibody throughout the proteins of the particular serum examined, and the data yielded by the examination of the serum fractions of horse H4 show a similar general distribution of antibody (Table II.).

The statement made by Weyer, Park, and Banzhaf,[3] that there was a loss of antibody amounting to about 50 per cent. in their process of concentrating antipoliomyelitis serum, may be explained by the circumstance that the protective substance does not appear to be concentrated entirely in any one of the serum proteins.

COMMENT.

An antiviral serum of marked activity against the poliomyelitis virus has been produced by the intramuscular inoculation of the living virus in two horses. Two other animals completely failed to respond.

Weyer, Park, and Banzhaf,[3] and Schultz and Gebhardt,[4] in America, have also recently reported the successful immunisation of horses by the active virus, and it would therefore appear that the horse is a suitable animal for the production of an antipoliomyelitis serum for therapeutic use, though at present we have no means of ascertaining without trial whether any one horse is likely to respond.

This serum has been used in a few cases of poliomyelitis in this country, but it has not proved possible, so far, to draw any conclusion with regard to its efficacy. It is well known that the variable nature of the disease makes it difficult to assess the value of specific forms of treatment in the prevention of paralysis, and it is generally believed that specific treatment with convalescent serum is likely to be of small value when given after paralysis has appeared. It may be expected, however, that the renewed interest aroused by the production of antiviral serum in large animals may lead to much-needed information on these debated points.

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CLINICAL AND LABORATORY NOTES

THE CREASES ON THE MINIMAL DIGIT IN MONGOLISM.

By L. S. PENROSE, M.D. CAMB.,

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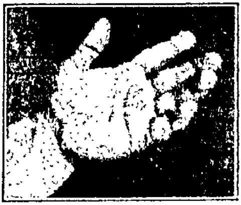
SOME of the dispute concerning the ætiology of mongolism arises from doubt concerning the precise physical signs which are, or are not, characteristic of the condition. Clear-cut signs which are easily recognised are therefore of importance, and the morphological peculiarities of the hand are physical signs which have these qualities. The transverse simian crease on the palm of the hand is, however, frequently seen in normal persons. The incurving minimal digit is a sign with many degrees of intensity and is present in a variety of different conditions, while a short minimal digit is characteristic of all so-called degenerate types of hand.

A simple and very definite abnormality found almost exclusively among aments of the mongolian type, which seems not to have been hitherto described, is the replacing of the usual three creases on the minimal digit of the hand by two creases only, so that the markings on this finger resemble those on the thumb, although the correct number of phalanges is present.

The little finger has normally a distal single crease nearly opposite the distal interphalangeal joint, a medial double crease just below the proximal interphalangeal joint, and a basal digital line which is complex.[1] In the anomaly described here a new crease, usually double in character, takes the place of the distal and medial creases, and it lies between the distal and proximal interphalangeal joints.



The accompanying photograph is of the left hand of a female mongolian defective, aged 40. The unusual line on the minimal digit is clearly marked. An elderly patient was chosen purposely, in order to show that age does not obscure the clearness of this sign. The minimal digit of the patient's right hand has the usual creases, although it does not differ from its fellow in length or in the configuration of the complex basal line. The transverse simian crease is not present on either hand in this case.

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[1] Jones, F. Wood: The Principles of Anatomy as seen in the Hand. London, 1920, pp. 67–68.

It is interesting to compare the incidence of this latter peculiarity with that of the anomalous creasing of the minimal digit. In a series of 60 mongolian defectives, 44 of whom are under the care of the Royal Eastern Counties Institution, the absence of one of the creases of the little finger was observed in 16 cases. In 8 of these the abnormality was present on one hand only. The transverse palmar line occurred in 27 cases, and was present on one hand only in 10 of these. The latter anomaly seems therefore to be about twice as frequent as the former.

These two peculiarities are often met with in association. They are to be seen together in the photograph by Dr. T. Brushfield, reproduced in Tredgold's text-book.[2] In the series of patients referred to above, both anomalies were present on both hands in three cases, and in five others they were simultaneously present unilaterally. The number of associations of these two uncommon peculiarities here is greater than that which would be expected if their occurrence together were merely a chance affair. This fact suggests that the causes of the two peculiarities are related to one another.

I am indebted to Dr. F. D. Turner for permission to publish these notes, and to the Medical Research Council and the Darwin Trust for financial assistance.

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[2] Tredgold, A. F.: Mental Deficiency, Plate XX., 5th edition, London, 1929.

WAX BATH TREATMENT.

BY H. W. HALES, M.D. CAMB.

THE full-length wax bath was first employed in France about 20 years ago, but it is only during recent years that it has attained the recognition which it deserves. The employment of paraffin for burns and as a method of administering heat locally to joints has, of course, been widely known for a much longer period.

The technique of full-length baths consists in applying a large quantity of wax in a liquid state to the whole of the body at a temperature of 120–130° F., depending on the skin sensitiveness of the patient. The wax rapidly solidifies when it touches the skin, and at the same time contracts. Heat-loss is reduced to a minimum by applying further layers of wax on the top of the first. The whole wax coat is then still further insulated by folding over and approximating the edges of the paper on which the patient lies, and one or two layers of waterproof sheeting are also folded over the patient. In cold weather a blanket can be added. The first treatment usually only comprises the legs and thighs; the second goes as high up as the umbilicus; and the third or fourth embraces the whole body up to the neck except one arm. The total skin surfaces finally covered depends on the reaction observed during the first two or three treatments. Profuse sweating occurs in from 2 to 10 minutes both on the free skin surfaces and under the wax. After a period varying from 15 to 30 minutes the wax is removed and the patient massaged with eau-de-Cologne as a grease solvent. He then rests for 15 to 30 minutes in a cool room, and can either have a cold or tepid spray or bath, or else dress. The oral and rectal temperatures and pulse are taken before treatment, and the oral temperature and pulse at frequent intervals during the treatment. At first the pulse rises to 90–96, a little out of proportion to the temperature (if a normal ratio of 90 pulse to 99 temperature and 100 pulse to 100 temperature, and so on, is assumed), but as soon as free perspiration has been established the temperature rises and the pulse falls and they attain their normal ratio. The blood pressure falls slightly. The temperature rises from 1 to 4 degrees, depending on the personal idiosyncrasy of the patient and the amount and temperature of the wax used.

The hydrogen-ion concentration of the sweat varies with its dilution, and the parts of the body. The baths are given daily or alternate days until the sweat pH is alkaline on its first appearing, and the interval between the baths is only increased when the blood pressure is low, or when the activities or peculiarities of the patient prevent daily treatment.

It has been claimed that one of the most marked features of this treatment is the absence of skin erythema indicating that the wax has a constricting effect which prevents cutaneous vasodilatation, but I have not observed this.

Contrary to expectation, after the first few minutes there is no sense of constriction from the solidified wax, probably because its elasticity allows for stretching as the pores exude sweat. For this reason it does not seem possible to subscribe to the theory that there is less removal of blood from vital internal organs to the periphery in this than in any other form of pyretic treatment.

The physics of this treatment are open to speculation both as regards the possible effect of the initial contraction of wax, and the curious fact that owing to its super-cooling wax becomes hotter on solidifying only to cool very slowly; but here one has to consider how the temperature of the wax immediately against the body is modified by that of the skin and sweat. In this treatment one has a very perfect form of increased heat administration to the skin and elimination of heat loss to a minimum. The weight of wax is also interesting, being lighter than water and heavier than foam when compared with the somewhat similar idea embodied in Transkutan and foam-bath therapy. All these pyretic treatments can be conveniently classified according to the weight of the agent used, beginning with Pistany mud and descending through Droitwich brine, Transkutan, wax, foam, Percy Wilde pyretic couch, to radiant heat, infra-red baths, and four-pole pyretic diathermy which have no weight at all.

It is not proposed in this short communication to discuss the relationships and differences of these various treatments, but there can be no doubt that in wax we possess a valuable therapeutic agent which in certain cases works better than any other, and in a few is the only method which will give results. It must be emphasised, however, that it produces marked reactions and that indiscriminate administration by unqualified persons who are not under medical supervision may do more harm than good.

ENLARGEMENT OF CHELMSFORD HOSPITAL.—Extensions of this institution, costing £32,000, were opened last week without formality. They include a ward each for men, children, and casualties, and the total accommodation has been brought up to 114 beds. Other additions are a new out-patients' department, dispensary, eye clinic, minor theatre, consulting rooms, private ward block, and an administrative block; the adjoining nurses' home has also been enlarged. A sum of £12,000 remains to be raised.

BRITISH MEDICAL ASSOCIATION.

ANNUAL MEETING IN EASTBOURNE.

SECTION OF OBSTETRICS AND GYNÆCOLOGY.

The second session of this section was devoted to the causation and treatment of

Menorrhagias not due to Uterine Disease.

Mr. A. S. Parkes, speaking on the physiological aspects of menstruation, said that in lower mammals the ovarian cycle consisted of two phases, the follicular or œstral phase, in which the Graafian follicle matured and ruptured, and the luteal phase, in which the corpus luteum developed. In the first, only minor changes occurred in the uterus, but in the luteal phase the uterus was prepared by an increase of its physiological sensitiveness, with or without proliferation of the endometrium, for reception of the fertilised ovum. If pregnancy did not take place the prepared endometrium retrogressed, the severity of the process of destruction varying in different species and the resulting hæmorrhage also varying in amount. In certain animals, however—e.g., the dog—hæmorrhage into the uterine lumen was found in the immediate pre-ovulation phase, the hæmorrhage then indeed being more pronounced than that at the end of the luteal (pseudo-pregnant) period, while it might continue then for as much as ten days. In attempting to interpret the human menstrual cycle in the light of the facts pertaining to lower animals two theories had to be considered: (1) that menstruation is a pre-ovulation phenomenon; (2) that it is an exaggerated homologue of the pseudo-pregnant breakdown found in many of the lower mammals. The weight of evidence was in favour of the second view. On this view alone, however, menstruation depended on the preliminary development of the corpus luteum, and it was now known that menstruation could occur in absence of ovulation. Since it was known that the œstral changes of the accessory organs of lower animals might take place without a morphological cycle in the ovary, this fact of course favoured the view that the breakdown was pro-œstral in nature.

Much assistance could, however, be obtained from the lower primates. In the baboon the follicular phase, during which the follicle developed, was characterised by the appearance of an enormous swelling of the vulva, which subsided after ovulation. About ten days later menstruation of the usual type appeared. The start of the cycle at puberty was marked by the appearance of the external swelling, and so there could be no doubt that in this mammal the follicular phase began and passed away some time before the onset of menstruation. It was thus possible to say that menstruation was not a straightforward pro-œstral phenomenon. On the other hand, when the monkey failed to ovulate, the same external signs of the follicular phase appeared, followed by menstruation as usual but with no premenstrual development of the endometrium; this occurred only in presence of a corpus luteum. The menstruation there and the necrosis leading to it were independent of atrophy of the corpus luteum. From the point of view of treatment of menstrual irregularities it was of the first importance to discover what the factor was that led to necrosis of the endometrium, and some fresh evidence had lately become available. Some years ago Allen showed that injection of œstrin into ovariectomised monkeys led to menstruation, and recently Hartman had shown that this effect was entirely lacking if the animal were hypophysectomised. It was thus necessary to assume that Allen's results were due to activation of the pituitary by œstrin, and that the substance causing necrosis of the endometrium was hypophyseal in origin.

CAUSATION, CLINICAL FEATURES, AND TREATMENT.

Dr. James Young said that the group of uterine hæmorrhages under discussion included the majority of cases of bleeding uteri, and the bulk of those cases which in the past had been described by such terms as chronic endometritis and metritis, fibrosis uteri, and subinvolution. He described the pathological and clinical features of metropathia hæmorrhagica (Schroeder's disease), the main symptom of which was metrorrhagia or irregular continued bleeding, and which characteristically occurred between 40 and 50. The endometrium showed a diffuse hyperplasia, often polypoidal, with cystic dilatation of glands and extensive areas of necrosis, while the ovaries exhibited characteristic changes—namely, cystic degeneration of follicles, and failure of formation of corpora lutea. Polymenorrhœa or too frequent menstruation was another common type of dysfunctional bleeding often accompanied by prolongation and quantitative increase in the flow. The shortened menstrual rhythm was associated with a corresponding shortening of the follicular cycle in the ovary, without any very constant changes in the endometrium.

Dysfunctional menorrhagia—excessive or prolonged flow at normal intervals—might also be due to ovarian aberration, and accompanying endometrial changes though not constant were often present. Schroeder, however, believed the chief cause to be hyperæmic states in the pelvis and inadequate contractility of the uterine muscle. Post-menopausal bleeding was not infrequently found in the absence of any gross uterine disease, and it might be that a temporary rejuvenescence of the ovary was responsible, or where the bleeding was excessive a structural degeneration in dormant follicles. In 72 cases of post-menopausal hæmorrhage Dr. Young had found 11 in which all factors other than ovarian had been excluded. Of 86 consecutive hospital cases in which the well-known causes of uterine bleeding—such as tumours and malignancy—had been excluded, 13 were cases of menorrhagia, 28 of polymenorrhœa, 39 of arrhythmic and continuous bleeding, and 6 of post-menopausal bleeding. Dr. Young pointed out the frequent association between cervicitis and menstrual irregularity and excess. In a consecutive series of 177 cases in which chronic cervicitis was the sole recognisable pelvic lesion, either menorrhagia or polymenorrhœa was present in 63 per cent. Such cases were often cured by treatment directed solely to the cervix. These findings were in keeping with the view that the cervical disease provoked the bleeding through the medium of an ovarian hormone. Another important factor was general organic disease which was present in at least 29 out of the 86 cases, while the important part played by infection was indicated by the fact that 33 of the 86 cases dated from childbirth or abortion.

As regards diagnosis, Dr. Young stressed the importance of eliminating by complete investigation such causes of bleeding as cancer and fibroids. When physical examination failed to provide an adequate explanation of the bleeding a curettage should be carried out. Bleeding in the 'teens was the only exception to this rule, and in such cases treatment might usually be begun forthwith on a clinical diagnosis.

In treatment ovarian extracts had been disappointing in his hands, though with Sistomensin cure was reported in 5 out of 23 cases, while 5 others were much improved. Relief, immediate and permanent, might follow curettage. Of his 86 cases, in all of which curettage was done, cure followed in 11, but in 4 of these a chronically inflamed cervix was cauterised at the same time. If curettage failed the choice lay between hysterectomy, and radium or X ray sterilisation.

GENERAL DISORDERS.

Dr. H. **Gardiner-Hill** discussed the problems of menorrhagia in relation to general medicine. While menorrhagia might be a symptom in a number of different diseases, in some it played such a subsidiary part in the clinical picture that it was unlikely to come under the notice of the gynæcologist—e.g., the menorrhagias sometimes found in chronic cardiac failure. In other general diseases, however, menorrhagia might be one of the primary symptoms. He divided the cases into three main groups: (1) circulatory disorders; (2) the hæmorrhagic diathesis; (3) ductless gland dystrophies. Under the first heading he included active and passive congestion. Menorrhagias due to passive congestion rarely came first to the gynæcologist. Usually the general symptoms were pronounced. Active congestion, especially that due to hypertension, was an occasional cause of obscure menorrhagia. The general symptoms were often slight. The menorrhagia usually improved as a result of measures which lowered the blood pressure. He thought some of the menorrhagias of the climacteric where cardiovascular disease was present and the blood pressure high might also be accounted for on this basis. The second group, the hæmorrhagic diathesis, was somewhat ill-defined. These cases were not common, though he had seen two or three examples of a tendency to thrombocytopenia. A history was usually obtained of a tendency to bleed easily. There were often recurrent attacks from childhood of epistaxis, gastric or intestinal hæmorrhage, or prolonged bleeding after slight operations. In these cases the menorrhagia usually dated back to puberty and there was a deficiency of blood platelets. In the third group he would include disturbances in the internal secretion of the ovaries, the thyroid, and possibly the pituitary. Puberty menorrhagia was often associated with precocious development of the secondary sex characters and a peculiar type of skeleton, the lower extremities being abnormally short in proportion to the trunk, owing to early closure of the epiphyses. This was due to hyperovarianism. In primary ovarian deficiency the opposite condition occurred (eunuchoidism) and there was primary amenorrhœa. He thought that skeletal measurements and radiography should form a routine part of the examination in such cases. Thyroid deficiency was a common cause of menorrhagia, especially at puberty or the climacteric. Puberty cases were often associated with simple goitre, those at the climacteric with myxœdema. Myxœdema was particularly liable to develop after the climacteric. When, however, it developed before that time menstruation, if affected at all, usually showed a tendency to menorrhagia. In the last ten years he had seen over 100 cases of myxœdema, 17 of whom had a history of severe pelvic operations for menorrhagia when there had been no apparent pelvic cause. The patients subsequently developed typical myxœdema, and it seemed most likely to him that the original menorrhagia had been one of the first symptoms. Treatment with thyroid was often successful. He had not found hyperthyroidism at all a common cause of menorrhagia. In Graves's disease menstruation was often unaffected; in many cases amenorrhœa was present during the active stages of the disease. The rôle of the pituitary in relation to menorrhagia was as yet undecided, though recent work had shown that the anterior lobe was intimately connected with ovarian development.

CAUSES AND CURES.

Dr. S. **Zuckerman** said that theories of the cause of menstruation were of two kinds—those which attributed it to the removal and those which regarded it as due to the addition of some influence. To the first group belongs the view that it is due to the removal of the effect either of the corpus luteum or of the follicular hormone. The corpus luteum hypothesis had been discredited, since menstruation took place in cycles in which ovulation had not occurred. The œstrin hypothesis rested on indirect evidence. To the second group belonged Hartman's theory that menstruation was due directly to the activity of a substance elaborated by the anterior lobe of the pituitary. This hypothesis was the most hopeful, for one thing since it suggested such ready experimental methods for its verification.

Mr. St. **George Wilson** reviewed 92 cases treated in the last nine years. Curettage was, he thought, essential in patients of 40 years and over, but was not likely to cure. Hysterectomy was rarely necessary, but if it was done the vaginal route was preferable. Radium was ideal in doses of 200–2500 mg.-hours, and the younger the patient the smaller should be the dose. X rays were less valuable in hospital patients who wished to be cured soon, and who were apt to be discouraged if immediate results were not obtained.

Dr. W. **Langmuir Watt** said that for temporary sterilisation by X rays 27 per cent. (4 radiations of 15 minutes each) and for permanent sterilisation 35 per cent. (4 of 18 to 20 minutes each) of a skin erythema dose was required. For the former slightly larger doses were required in patients under 30 than over. With the same dosage patients under 30 would have amenorrhœa for about a year, but over 30 for about 18 months. There was usually one period after sterilisation which might be profuse. Polymenorrhagia might be associated with hypofunction of the thyroid, and a small radiation to this gland might restore normal periodicity, and this in young women might be combined with a small radiation to the spleen. If it failed, then a temporary sterilisation of only one ovary should be carried out, and cured in 50 per cent. of cases. If this failed the other ovary could be temporarily sterilised. Sterilisation by modern apparatus was simple, safe, and avoided all exposure.

Prof. J. B. **Dawson** said that conditions of the corpus uteri that caused menorrhagia were commonly associated with cervical lesions. These might lead to hormonal disturbances consequent upon inflammatory thickening of the ovarian cortex following the cervical infection. In the specimen shown by Dr. Young (as an example of metropathia hæmorrhagica) the cervix was cystic and hypertrophied—a post-infective lesion.

Mr. ERIC STACEY quoted the well-known experiment in which during laparotomy a ripe follicle was punctured and menstruation followed in 30–36 hours. This showed that some process was initiated by which the necrosis of the endometrium was brought about—possibly the liberation of a hormone which produced activity of the anterior pituitary lobe. So far nobody had suggested what stimulated production of this anterior lobe hormone. Collip, of Toronto, had recently isolated a hormone from the ovary which had a similar effect to the injection of the anterior lobe hormone called emmenine. This hormone was present in the ovary in addition to the œstrin and corpus luteum hormones. It was not improbable that many of these cases of menorrhagia and epimenorrhœa were brought about by over-production of a pro-œstrus hormone. He had often noticed that a condition in the ovaries of sclerosis with over-production of follicles was present in conditions associated with pelvic congestion from whatever cause and productive of symptoms such as these under discussion.

The PRESIDENT (Mr. EARDLEY HOLLAND) said that every case of menorrhagia should have a full medical investigation, including a platelet count. He doubted if high blood pressure could by itself cause menorrhagia. X rays appeared to have this advantage over radium, that by it one could cause temporary sterilisation, while with radium this was difficult.

SECTION OF ORTHOPÆDICS.

AT the first session of this section Mr. A. S. BLUNDELL BANKART, the President, took the chair, and a discussion on the diagnosis and treatment of

Common Injuries of the Knee-joint

was opened by Mr. NAUGHTON DUNN. With increasing experience of injuries of the knee-joint, he said, he became more and more convinced that exact diagnosis of the injury was often impossible before operation. Describing the normal anatomy, he pointed out that as the joint connected the two longest bones in the body, it was subject to enormous leverage, and had therefore been provided with powerful muscles and with very strong ligaments which limited movements in all directions except flexion. Rotation at this joint was only possible in the flexed position, which doubtless accounted for the fact that in his experience strain of the flexed knee was responsible for the great majority of injuries to the intra-articular cartilages. Although anatomists described 12 bursæ in connexion with the knee, surgeons only took note of four as a source of symptoms, though possibly affections of some more deeply seated might be the cause of some lesions whose diagnosis was obscure. Articular cartilage was avascular, and this meant that it had little power of repair. The synovia not only oiled the joint, but was also richly supplied with sensory nerves, which made it a great source of pain. In connexion with swellings of the joint, it should not be forgotten that œdema of the infra-patellar pad of fat might closely simulate effusion into the joint itself.

Mr. Dunn showed a table analysing the lesions found in 522 consecutive cases of injury to the knee-joint, of which 179 were diagnosed as lesions of the internal semilunar cartilages (139 being confirmed by operation) and 71 of the external cartilages (46 confirmed by operation). Practically all subsequent speakers commented on this proportion of external cartilage injuries as most abnormally high, and Mr. Dunn in his reply was unable to account for it, but said he was sure it was not due to any clerical error, for even in the records kept personally by himself it still appeared. In the series lesions of the internal lateral ligament accounted for 34 cases and loose bodies for another 34, while each remaining group, such as crucial ligament injuries, articular fractures, Osgood-Schlatter disease, and direct infections, each only accounted for a small number. Many indefinite cases responded to manipulative treatment, which suggested that they were due to adhesions, and probably another considerable group were due to subacute, infective arthritis.

Mr. Dunn thought that one might safely make a diagnosis of damage to an intra-articular cartilage if there was a history of recurrent locking with pain and tenderness limited to the attachments of the cartilage, and provided that the joint regained normal function between the attacks. The types of cartilage injury found at operation were: tears of the anterior end; tears of the posterior part; and bucket-handle tears. Several cases were described in which the cartilage appeared normal at operation, but its removal cured the symptoms. In other cases, tenderness and pain referred to the inner side of the joint were found associated with a lesion of the external cartilage only, while simultaneous lesions of both cartilages did occur; accordingly when a typical history had led to exploration of the inner side of the joint and a normal cartilage was found, it was advisable to explore the outer side of the joint also. Mr. Dunn also referred to the difficulty presented by a slipping patella, whose history might simulate cartilage injury, while the actual dislocation was seldom witnessed by the medical attendant. Such cases were best tested in the gymnasium. Under the anæsthetic one should note whether the patella on the affected side had more lateral mobility than on the other side. Loose bodies also presented difficulties in diagnosis, but the locking in such cases was apt to be very temporary. Radiograms were shown of a case in which a piece of metal had travelled in the course of months from the inter-condylar region, where it caused intermittent symptoms, to the lower part of the popliteal space. A specimen was shown of a loose body detached from the back of the patella by a direct blow on the front; in such cases early operation was advised, as the fragment was likely to cause increasing damage to the articular cartilage. Mr. Dunn found that damage to the internal lateral ligament was caused by force applied to the extended knee, the opposite to that affecting the internal cartilage; tears were seldom complete, and many recovered entirely without operation. Where damage to both ligament and cartilage was suspected, he advised waiting till the ligament had healed before opening the joint for removal of the cartilage. For fractures of the tibial spine he recommended gradual extension of the joint and splintage before operation; for crucial ligament injuries, also, he advised conservative treatment as far as possible, seeing that he found that operative repair had not been able to restore the joint to normal. This was the reverse of the results of operation on cartilages, for in a series of 65 professional footballers a very high percentage had been able to return to this most strenuous of games, even after removal of both cartilages. Regarding the technique of operation for internal cartilages, he advised a small internal incision, nearly vertical, so as to avoid the patellar branch of the internal saphenous nerve, which in his series of cases had seven times resulted in a painful neuroma, demanding subsequent operation.

In connexion with injuries of the extensor apparatus, he suggested that the greater was the flexion of the knee at the time of the accident, the higher would the damage occur—e.g., tears of the ligamentum patellæ occurred with an almost extended knee. He showed among others radiograms of a bipartite patella, which might easily be misdiagnosed as a fracture.

DISCUSSION.

Sir ROBERT JONES agreed with Mr. Dunn that in many internal derangements of the knee diagnosis of the exact lesion was impossible, while cases of classical cartilage symptoms might prove at operation to be something quite different. He thought it was usually possible to differentiate between injury to an internal and to an external cartilage, though locking was common to both; usually in the *first attack* the pain was correctly localised, though in the later attacks of recurrent cases it might be felt on the wrong side of the joint, so that he considered a careful history of great importance. It was rather the sudden, complete *unlocking* from flexion that was so diagnostic, and if flexion only yielded gradually, he would not consider it a case of cartilage injury at all. Clicking was more common with external than internal cartilage damage. Pain on abduction and adduction suggested injury to a ligament. In view of the fact that many injured cartilages only gave one attack of symptoms, Sir Robert advised reduction by manipulation in the first instance and reminded his hearers that reduction was never complete unless it gave full extension of the joint and immediate relief of discomfort; it was no good trying to persuade oneself or the patient that the cartilage had been reduced unless these conditions were fulfilled. He treated cases by two or three weeks of full extension during walking and after this crooked the inner side of heel of the boot, also prescribing inward rotation of the limb during running and walking. The actual technique of reduction of a cartilage was simple—i.e., the knee should be acutely flexed, rotated in and out and extended. In an unreduced case of many weeks' standing, the knee should in addition be moved in all directions to break adhesions. For this purpose the knee should first be fully flexed, then fully extended, and finally flexed with the thigh hyper-extended, since this tightened all the structures on the front of the thigh; from the flexed position the knee should be extended, during which act the tibia should be rotated 10 or 15 times. Finally, the knee should be flexed while the surgeon's forearm was placed in the popliteal space and used as a lever.

In considering the treatment of ruptured crucials, one should not forget that excellent recoveries occurred with conservative treatment after complete dislocation of the knee, where every ligament must have been torn. A tibial spine displaced forward so as to prevent complete extension of the knee should be removed. Operation for torn cartilage was desirable in every recurrent case, and essential if effusion kept occurring in a patient who wanted to take part in athletics. Sir Robert agreed with Mr. Dunn that even if a cartilage appeared normal at operation it should be removed completely, for certain posterior lesions could only be discovered in the process of removing the cartilage. For loose bodies he advised either syringing, or else anchoring the body by a needle before opening the joint.

Mr. H. A. T. FAIRBANK pointed out that the extreme wasting of the quadriceps in cases of knee injury could not be due to fatigue in those cases where there was no spasm, but it must be of the nature of a reflex inhibition. He suggested as sources of obscure pain lesions of the popliteus tendon, the ilio-tibial band, and the insertion of the semi-membranosus. To bring the posterior end of a cartilage into view at operation he advised a blunt hook. He recommended that all complete ligament tears, not mere strains, should be treated by early suture. He thought that lesions of articular cartilage were less uncommon than is generally supposed, and also that fractures of the tibial spine were of two types: (1) a shearing by the internal condyle of the femur, which gave only slight displacement and did not need operation; (2) tear of an anterior strip by hyper-extension, which required suture or pegging.

Dr. W. H. W. ATTLEE gave an account of the lesions found in schoolboys, the commonest being effusion, associated with rapid atrophy of the thigh muscles, while epiphysial injuries came next in frequency, and meniscus injuries third. The effusion soon cleared up if a few days' rest in bed were immediately followed by regular exercise on a bicycle or at rowing. He thought prolonged rest was far too often prescribed, while direct massage to the joint delayed recovery. The common lesion associated with pain in the tibial tubercle occurred chiefly in the football season and cleared up when football was stopped—e.g., in the running season. Painful heels then took its place. Radiographic diagnosis of lesions of the tibial tubercle was fallacious, as demonstrated by various prints, some showing peculiarities in the absence of symptoms, others the reverse. In any case it was essential to radiograph both sides for comparison. Dr. Attlee pleaded for greater confidence in the reparative power of Nature.

Mr. ROWLEY BRISTOW emphasised the importance of early exercise after operation for the removal of a cartilage. His practice was to make the patient lift the limb off the bed a few days later; he began faradism on the sixth day and got the patient up on the tenth, but continued treatment till the full range of joint and muscle power had returned.

Mr. T. P. MCMURRAY asked that the term "locking" should be abandoned as misleading, for it was the sudden unlocking that was characteristic. He disapproved of a pessimistic attitude in regard to diagnosis, and demanded more accuracy, which he said could be attained by his method of examination—i.e., flexing the knee completely, then, as it is extended, rotating it at each angle, which gives a localising pain and usually a click also.

Mr. ROBERT OLLERENSHAW showed interesting radiograms of a complete knee dislocation with excellent function after reduction. He pleaded for rest and fixation in plaster for about six weeks in the early stages of Osgood-Schlatter disease. In regard to the level of injuries to the extensor apparatus, he thought age determined it, tears of the quadriceps tendon occurring in the elderly.

Mr. R. C. ELMSLIE did not approve of resting a knee after reduction of a displaced cartilage, and quoted a case of the Oxford boat captain who rowed a trial course 24 hours after it. He advised a compression bandage, to be kept on during faradism to the quadriceps. He diagnosed patellar dislocations by noting that in the last stage of active extension the patella moved outward more on that side.

Mr. LAMING EVANS laid stress on complete removal of a cartilage, which could be done through the usual incision by rotating the tibia outward in flexion.

Mr. McCrae Aitken highly approved of cycling and rowing in after-treatment, as they provided a physiological push, without grinding of the joint surfaces.

Mr. Rocyn Jones thought that the results of cartilage operations depended on the age of the patient and on the condition of the quadriceps. He held that the relative frequency of external cartilage lesions in the young, even at 4 years old, was due to congenital abnormalities; he had removed one which was disc-shaped.

SECTION OF PUBLIC HEALTH.

At the meeting of this section, held on July 23rd, the chair was taken by Sir George Buchanan, the President, and a paper on public health problems attendant on

Air Travel

was read by Dr. A. Massey. The contingencies introduced by aerial navigation were, he said: (1) that journeys could be accomplished within the incubation periods of the major infectious diseases; (2) illicit or forced landings might result in importation of infection at places other than authorised air-ports equipped to deal with it; (3) infected mosquitoes could be brought from fever zones alive; and (4) aircraft might let fall refuse matter capable of conveying infection. Plague, cholera, yellow fever, small-pox, and typhus all had incubation periods longer than the corresponding period of air travel from infected countries. Apparently healthy passengers from these places must be kept under surveillance until the incubation periods had expired, unless they were known to be immune. It was essential that passengers should be free from manifest infection on embarkation and that aircraft should be cleaned, deratised, and de-insectised before departure. It was possible to import mosquitoes infected with yellow fever, but they would probably perish with the first cold weather. Special precautions, however, would need to be taken at air-ports of departure to ensure freedom of aircraft from mosquitoes. Rat harbourage in aeroplanes was limited, but by no means unknown. Vermin were unlikely to be carried by passengers who could afford air transport. Aircraft, unlike ships, were not limited to natural ports, and thus the importation of infection was more likely to occur. Illicit landings should be suppressed, and forced landings made notifiable to the nearest customs and sanitary air-port. Stringent international rules would be necessary to prohibit the voidance of refuse from aircraft over land. A conservancy system was essential for long-distance aeroplanes. The heating and ventilation of long-distance passenger aircraft presented peculiar difficulties. Selected aerodromes should be recognised as customs and sanitary air-ports for international travel, and to these would be attached medical and sanitary personnel.

The President said that presumably necessary sanitary precautions would be made available at ordinary customs aerodromes, but that special aerodromes would be set apart for more complex procedures, such as deratisation. Many unnecessary limitations in the past had been placed on shipping—for instance, the "bill of health" and "observation." It was important that these should not be imposed on aircraft. The requirements needed careful thinking out in advance. Air travel introduced new risks, especially from diseases of short incubation period.

Sir Malcolm Watson said that the biggest sanitary problem in the world at the moment was the probability of yellow fever getting from the West Coast of Africa to the East Coast, where it would certainly not be diagnosed, and whence it would certainly spread to Asia. He recalled the elaborate efforts necessary to eradicate the fever from Panama. Shipping would take it to Bombay and Colombo, where anti-mosquito work was in an extremely bad condition. The results—with a death-rate of 75 per cent.—would be appalling, and trade with the East would be paralysed. Civilisation would be shaken to the ground. The first step was to prevent aeroplanes from carrying the disease across Africa.

The President said that the international agreement against the transmission of yellow fever would be based on precautions against embarkation in the endemic areas.

Dr. Massey, replying to questions, said that he had no authentic evidence that rabies had been brought into the country by smuggled dogs, but it was certainly a disease that might be spread by aircraft.

Isolation Hospitals.

Dr. E. H. R. Harries read a paper on the Function of the Isolation Hospital in Modern Practice. He said that the isolation of the infectious sick involved also treatment, and should include teaching and research. Isolation of early cases was of great value in epidemic disease, but of very little in endemic disease, which could only be rationally controlled by active immunisation of susceptibles. Nevertheless, the isolation hospital played an important part in the care of patients under special circumstances, and its existence was justified. Its available accommodation was not, however, always used to the best possible advantage. It was unique in having no casualty or out-patient department or convalescent home. Cases were admitted direct from the general practitioner, and the inevitable result was the unnecessary isolation of large numbers of adults and children, especially in diphtheria epidemics, with resulting pressure on the accommodation. The value of the swab in diagnosis was as much over-estimated in diphtheria as the value of a timely dose of antitoxin on suspicion was under-estimated. Patients were also kept through convalescence, partly from a quite disproportionate fear of infectiousness in that period. Some infections could not be adequately treated outside an institution, but rubella, chicken-pox, and many cases of scarlet fever could be treated at home. The public needed, however, to be more impressed with the gravity of whooping-cough and measles. Treatment of fevers had become more complex, and demanded team-work and as complete a technique and equipment as the treatment of any other disease.

The fever hospitals had a monopoly of the material necessary for the clinical teaching of fevers and, with one exception, these institutions were controlled by public health authorities. The ex-resident medical officers formed but an infinitesimal part of the whole profession, yet these were the only doctors who had adequate clinical experience of fevers. By some means the material in these hospitals should be made available for undergraduate and post-graduate study. The student might clerk for a period in a fever hospital and the young pediatrist be attached for a term to the staff. The contributions of the fever hospitals to original research had been very small indeed; there was no stimulus, no official recognition, and usually no equipment for research. The continental and American output, on the other hand, was high. The fever hospital could make a valuable contribution to the study of early rheumatism. Suitable medical officers should be set free from routine duties and encouraged to research, and applicants for research fellowships should consider the rich field offered by the fever hospital.

The PRESIDENT said that he thought there had never been a time of greater need for stock-taking in public health.

Dr. J. D. ROLLESTON agreed that large numbers of cases were sent to fever hospitals wrongly diagnosed and entirely free from disease, and that hospitalisation of scarlet fever was largely unnecessary and only carried out for the convenience of householders and private practitioners. Certain groups of cases, however, required hospital treatment—severe cases, and cases occurring in public places of business. The isolation of measles and whooping-cough had been undertaken to save life, not with the hope of eradicating the disease. Attendance at a fever hospital ought to take place at an early stage of the student's career; he would learn there matter which would stand him in good stead in any branch of practice, and would bring him into touch with at least half a dozen branches of medicine. More research was being undertaken than Dr. Harries had suggested. A further stimulus might be applied by insisting that officers intending to remain in the service should take their M.D. and M.R.C.P.

Dr. R. A. O'BRIEN suggested an unofficial inquiry into the responsibility for diphtheria deaths due to failure to receive early antitoxin. The percentage of misdiagnosed cases was striking, and might well be related to the present method of teaching. Fevers might well be treated in annexes to general teaching hospitals. He was less optimistic about research than Dr. Rolleston. In London there was a real attempt to produce an urgent spirit of clinical and pathological inquiry, but this was not found in the provinces. A review of the literature would not show a large contribution from this country. Every general hospital had its pathologist, but there were 30,000 fever beds outside London without a single pathologist. He suggested that new fever hospitals might be built in close touch with general teaching hospitals.

Dr. W. E. PORTER pleaded the difficulties of the general practitioner called on to treat scarlet fever in the home. If one child were treated at home the whole family had to stay away from work or school.

Dr. D. S. SUTHERLAND said he had been impressed by the different amount of teaching given to medical students on this subject; in many cases it was very inadequate, even for the D.P.H. course. Classes were often much too large. Possibly some of the old poor-law institutions could take over fever work, concentrating the work of a number of small institutions where both treatment and training for nurses were inadequate. Concentration near a general teaching hospital would aid both education and research.

Dr. ARTHUR HAWLEY declared that the teaching of medical students was quite inadequate. Dr. L. P. LOCKHART suggested that the system of clinical assistantships should be extended to fever hospitals. Dr. H. KELSON cordially supported the idea of centralisation, with pathological assistance on the spot. It was the duty of the practitioner to notify cases that were at all doubtful, and accurate diagnosis was the duty of the public health service. He thought that early discharge had gone too far; marked secondary results might follow mild cases of scarlet fever, and the period of rest was of value. He urged the importance of research. Dr. J. MORGAN REES emphasised the inconvenience caused by nursing infectious cases at home. Dr. JOHN HUTSON advocated the *notification* of *suspected* cases, as distinct from developed cases.

Poliomyelitis.

Dr. G. MURRAY LEVICK read a paper on the Organisation of Treatment for Infantile Paralysis. He said that unfortunately the acute attack was *often undiagnosed, the signs of paralysis following* a supposed attack of influenza. Prompt treatment depended on the alertness and coöperation of general practitioners and was very important, since it affected the ultimate issue. An important diagnostic point was muscular tenderness in acute pyrexia without obvious cause. The new anterior poliomyelitis antitoxin should be administered in the first few hours, partly intrathecally and partly intravenously, but was worth giving at any time during the fever. It was of the utmost importance to posture the parts correctly at the very outset, without pressure from bandages. When the antitoxin was given, cerebro-spinal fluid could be withdrawn, if desired, to relieve pressure. Measures must be taken to preserve the contractility of all affected muscles for at least a year before hope was abandoned, and the patient must be in the hands of specially qualified people. A common mistake in electrical treatment was excessive faradic stimulation; faradic current should never be given in the early stages and deep effleurage might do great harm. The acute attack was a great shock to the nervous system, and general rest and heliotherapy should be given for months or years. The best lamp was the carbon filament, with a mercury-vapour tube for ultraviolet rays. The paretic muscles should be irradiated with intense red light. Postural treatment might demand prolonged recumbency to prevent spinal and costal deformities. Such cases should be nursed in the open air all the year round. Organised institutional treatment alone could meet economically the many needs of these patients over long periods. There was a serious lack of organised treatment for paying patients of moderate means. These children needed a different environment and different education from those catered for by the public schemes that were now spreading throughout Great Britain. Dr. Levick showed slides illustrating the work at Chailey. Affected limbs should be slung from an overhead bar and not laid flat on splints. Slinging was a most important factor in re-education and recovery of tone. It allowed free movement within the child's limits without permitting stretching of the paretic muscles. It was no more unreasonable to demand daily treatment for years for these children than to demand daily education for healthy children.

Dr. HARRIES raised the problem of whether schools should be broken up on the appearance of a case of poliomyelitis, and commented on the remarkable benefits of modern treatment.

In reply to questions, Dr. LEVICK emphasised the importance of keeping paretic limbs warm and the advantage of a light windproof material over a single layer of wool for outdoor nursing in winter.

REVIEWS AND NOTICES OF BOOKS

Recent Advances in Medicine.

Sixth edition. By G. E. BEAUMONT, M.D., and E. C DODDS, M.D. London: J. and A. Churchill. Pp. 442. 12*s.* 6*d.*

THE success of this volume has been so great that new editions have been called for almost yearly since it was first published in 1924. The present edition differs very little from its predecessors, and its scope remains unchanged. Room has been found for some account of the Aschheim-Zondek test for the detection of pregnancy in the early stages, and a few pages are given to the discussion of uræmia. The account of treatment of pernicious anæmia by stomach extracts is also new, and a few minor additions and alterations have been made in other parts of the book.

On the whole the authors have well maintained their practical attitude to the subjects discussed, and their selection of material has been wisely made. Any temptation to include much recent work which is still only of theoretical interest or has not been fully confirmed has been resisted, and apparent omissions may indicate only that certain "advances" do not yet fulfil the rigid conditions which the authors have laid down for themselves. The recent use of the higher carbohydrate diets in diabetes is not mentioned in the chapter on this disease, where the indication is that the "veg. A," or 5 per cent. carbohydrate group, must be accurately weighed out to the exact ounce. The reputed value of salyrgan in cardiac as distinct from renal œdema is also ignored. The instructions given are so clear that the laboratory methods described can be easily carried out without expert assistance. Those who wish to keep up to date in medicine, as well as students for the higher examinations, will find here a most excellent review of modern additions to medical technique.

Medical Administration of Teaching Hospitals.

By EMMET B. BAY, M.D. Chicago: University of Chicago Press. 1931. Pp. 136. 9*s.*

THE investigation reported in this volume is one of a group of studies which Dr. Michael Davis has been enabled to subsidise through a grant generously made by the Rockefeller Foundation. Dr. Bay has selected 19 hospitals and clinics, nearly all of which are associated with medical schools in the United States. The aim of the investigation is not to propose a universally acceptable plan of organisation, but to present a comparison of many organisations, in order that those interested in the problems may draw some useful conclusions for themselves.

The fundamental differences between the hospital systems of the United States and of England make actual comparison between the problems of the two countries rather difficult. In regard to teaching, for example, Dr. Bay says that in the United States "in hospitals connected with medical schools most of the patients used by the staff for teaching purposes are those who occupy free beds. Pay-patients, whether in wards or private rooms, are used only occasionally. For this reason the number of free beds in any teaching hospital is always important." In England, where practically all the beds in the teaching hospitals are at least nominally free, this problem of pay versus free beds does not arise. Again, there seems to be in the United States a conflict of policy between the lay admission office and the teaching staff, similar to that which may occur between the advertising side and the editorial side of a newspaper. The admission office is primarily interested in what the patient can pay; the professional staff are interested in the medical needs of the patients and their value for teaching purposes. In England the admission of patients is almost without exception determined by the medical staff, and the office has only to register the admission. Financial considerations do not arise, though the hospital almoner is becoming more and more active in ascertaining how much of his maintenance expenses the patient can fairly be asked to pay, and in persuading him to contribute according to his means.

Other problems investigated by Dr. Bay, such as the Open or the Closed Staff, Tenure of Appointments, Governing Bodies, the Executive Committee of the Medical Staff, Hospital Superintendents, the Functions of the Dean, and many others, give ample material for consideration by the hospital administrator in England, and the information afforded and the conclusions drawn from this information by Dr. Bay are of interest.

The general conclusion reached by most of his readers will be that in a teaching hospital all administration should be determined by two main principles: (1) the business organisation of the institution should be in the hands of the lay governors, and (2) the admission of patients, the nominations for appointments on the hospital and school staff, and the general professional conduct of the work should be in the hands of those best qualified to undertake it—viz., the teachers themselves.

Dr. Bay has written a closely analytical study, which is fresh and stimulating, and should be read by all who are interested in the complex association and interrelation of the lay governing body and of the professional staff of a teaching hospital.

Crippled Children:

Their Treatment and Orthopedic Nursing. By EARL D. MCBRIDE, B.S., M.D., F.A.C.S., Instructor in Orthopedic Surgery, University of Oklahoma School of Medicine. London: Henry Kimpton. 1931. Pp. 280. 15*s.*

THE intention of the author is to supply information which will be of interest to those who have the care of crippled children, assisting them in the recognition and treatment of the more common orthopædic conditions, particularly in the early stages when so much can be accomplished. Chapters on the technique of orthopædic nursing and post-operative duties are followed by others giving a brief, but comprehensive, description of the various forms of paralysis improvable by orthopædic measures, of spinal and joint tuberculosis, of rickety and postural deformities, and of congenital abnormalities. Each section contains a clear statement of the nurse's duties, and the volume closes with a useful glossary of orthopædic terms. Illustrated by 150 photographs and diagrams, lucidly written and well printed, this book presents in simple terms that which every nurse and social worker who is brought into contact with the cripple should know.

Allen's Commercial Organic Analysis.

Fifth edition. Vol. VIII. By Eight Contributors, under the Editorship of C. A. MITCHELL, M.A., D.Sc., F.I.C. London: J. and A. Churchill. Pp. x.+761. 30s.

WITH each succeeding edition of this well-known treatise the original title still used becomes less completely descriptive of the subject matter, for not only are the industrial applications of organic analysis provided, but the sources, isolation, properties, reactions, and methods of estimation of many substances, familiar in scientific circles but not yet employed commercially, are included. The present volume contains contributions by four British and four American authors, and deals with glucosides, the bitter principles of plants, enzymes, putrefaction bases, animal bases and acids, cyanogen compounds, and the proteins and their digestion products. The subject matter includes much material of interest to the physician, pharmacist, and biochemist, notably the sections on digitalis, jalap, aloes, and other drugs; the enzymes from both animal and vegetable sources; the examination of urine and the estimation of its numerous normal and pathological constituents; urinary and biliary calculi; and the digestion products of the proteins. Nothing, perhaps, illustrates the rapid progress of science more than a comparison of such a work with the corresponding sections in the previous edition of 15 years ago, an interval during which much progress has been made both in the investigation and analysis of new and little known substances. Thus whilst numerous obsolete methods have been omitted newer, more rapid, and, in many cases, more accurate methods have replaced them, and the present volume contains some 50 pages more than its predecessor. The compilation of such a mass of information is a task of no mean magnitude, even for the combined efforts of eight authors, and the high degree of accuracy shown renders the volume one of outstanding merit. Frequent references throughout the chapters and a concise bibliography at the end of each enable the reader to trace original sources and to supplement, where necessary, the information given.

The subject matter of this volume does not lend itself to much diagrammatic or pictorial representation; the few illustrations consist chiefly of enlarged drawings or photomicrographs of crystalline organic compounds. There is a good index and the book will prove of value to a large group of workers, especially when faced with a problem off the beaten track.

Les diagnostics anatomo-cliniques de Paul Lecène.

Recueillis par ses élèves. I. *Généralités.* By P. PAVIE. *Lésions du sein.* By P. MOULONGUET, Professeur agrégé à la Faculté de Médecine de Paris, Chirurgien des Hôpitaux. Paris: Masson et Cie. Pp. 192. Fr.45.

THIS volume is the first of a series of similar manuals projected by the late Paul Lecène, who only lived to write the general preface. The books themselves have been undertaken by his pupils, who, with exemplary piety, reproduce the whole of the original manuscript of the preface at the beginning of each volume. The present contribution consists of 52 pages of a general account by Dr. Pavie, of the value of pathological investigations in surgery, and 140 pages by Dr. Moulonguet, describing the diseases of the breast from a clinical and pathological standpoint. The work makes no great claim to originality, but describes briefly the ordinary lesions of the breast, with their pathological interpretations along the generally accepted lines. The book is thus designed rather for the student than the specialist, and is made especially valuable to him by the large number of excellent illustrations, for the most part from photographs. The only illustrations in colour, two in number, have been lavished upon the rare condition of "fat-necrosis" of the breast. In the interest of the reproductions the whole book has been printed upon thickly coated paper, making it disproportionately bulky and heavy.

Recollections of an Old and Observant Practitioner.

By JOSEPH DANIEL MCFEELY, F.R.C.S.I. London: Edward O. Beck and Co. 1931. Pp. 246.

IN this little book Dr. J. D. McFeely, who has retired from practice after long services as general practitioner, hospital surgeon, and sanitarian in Dublin and Liverpool, sets out his experiences. The author has a low opinion of most of the modern developments of professional life, pours contempt upon the panel system, and regrets the old days of apprenticeship. He mixes sound therapeutical notes with political diatribes and Irish stories insufficiently new; and he writes with a sense of grievance. But the impression is made upon the reader of great sincerity.

British Journal of Children's Diseases.

To the July-September number of this journal (vol. xxviii.) Dr. I. M. Allen contributes a paper on Neurosis in Childhood, based on 160 cases personally investigated in the out-patient department of the National Hospital, Queen-square. He divides the factors which give rise to a neurosis into two groups—viz., those which make the child less able to face his environment and difficulties, and those which appear to excite the symptoms of a neurosis in the child at various stages of development. The former include physical and mental disabilities, biochemical disturbances, a special physical habitus, the position of the child in the family, father deprivation, lack of parental training, and maternal inexperience in association with a strong sense of responsibility. The exciting causes include the birth of the next child, illness of the patient or an older member of the family, rearrangement of family relationships, failure of social adaptation, school discipline, surgical operations, accidents, puberty, and economic maladaptation. Twenty-two illustrative cases are described, and the diagnosis and treatment of neurosis in childhood is discussed.—Dr. Francis Bach contributes a paper on the Incidence of Rheumatic Fever, based on observations in Great Britain, North America, Holland, Germany, and Scandinavia. He comes to the conclusion that the disease is widespread, its incidence being related to certain sociological and geographical factors. It is common in those parts of the world where the resistance of the individual is lowered by overcrowding, poverty, and inadequate diet and where the *Streptococcus hæmolyticus* is a not uncommon inhabitant of the human nasopharynx, while it is rare in those countries where poverty and overcrowding are absent and the *S. hæmolyticus* is not an inhabitant of the human nasopharynx.—Dr. J. B. Ellison describes two cases of thrombophlebitis complicating scarlet fever in boys aged 6 and 10½ years respectively. They presented the characteristic features of the condition described by Moorhead and Abrahamson under the title of phlebitis migrans—viz., dissemination of lesions in time and space, phlebitis of the lungs and abdominal viscera, and a favourable prognosis.—The abstracts from current literature are devoted to nervous and mental diseases.

of obscure origin. Aluminium has been found in certain plants—e.g., *Orites excelsa*, an Australian tree, and in various kinds of *Symplocus*, which as long ago as 1690 were called by Rumphius *arbor aluminosus*; but whilst Zbinden and Dutoit found it in human blood, and Wiechowski[1] estimated the quantity as over 0·004 per cent., Fox and Ramage failed to detect it there. Its presence in the feathers of birds, notably the jay, is to be regarded with some suspicion as feathers are apt mechanically to retain fine dusts, such as dried clay, which contain alumina. A considerable amount of work has been done on the effect of feeding various kinds of animals with food containing aluminium; in some cases the doses given were grotesquely large if the object of the experiment was to elucidate the question of the effect of aluminium cooking vessels and food containers on those consuming the food so prepared.

In a recent annotation[2] reference was made to controlled work at the Rowett Institute on the addition of aluminium to the diet of freshly weaned pigs. Since then the subject has been dealt with in another paper by this author. K. Mackenzie has reported[3] further work done there on young rats, and D. Tourtellotte and O. S. Rask similar work[4] in America. Mackenzie introduced the aluminium in the form of a baking powder containing acid calcium phosphate and sodium aluminium sulphate, whilst Rask and his colleague used aluminium chloride, the percentages of the metal in the foods, which were alike in other respects, being respectively 0·1 and 0·06. The controls used by Mackenzie received similar rations but containing only about 0·0001 per cent. of aluminium naturally present. He found that both groups throve well, the weights increasing from about 40 to 200 grammes in the course of 12 to 16 weeks. Analyses of the food, urine, and fæces were made for periods of 7 to 12 days. In the rats receiving only the aluminium naturally present in the diet the urine contained from 1 to 2 per cent. of the total input, in those receiving added aluminium only about 0·01 per cent. of the input was found in the urine, demonstrating that either the metal reached the circulation in mere traces, or was held up in the tissues. The large proportion—from 84 to 95 per cent.—recovered in the fæces showed that absorption was at any rate small. The difficulty of collecting the excreta completely may well account for the remainder, since analyses of liver, lungs, heart, stomach, and small intestine in groups of 8 to 10 rats showed aluminium contents of the same order in both those receiving this element and the controls. Tourtellotte and Rask's previous work led them to conclude that aluminium compounds are not toxic or detrimental to any biological function when present in diets in concentrations up to 600 parts per million (of the same order as they and Mackenzie had given to rats), that they were not appreciably absorbed out of the intestinal tract, and that animal tissues contained less than 2·0 parts per million of aluminium. Their conclusions having been challenged by other workers these authors have confirmed their work by showing that in some cases the challenge was based on erroneous interpretation of spectrograms. In the experiment referred to, which was directed solely to investigating directly the absorption of aluminium, the combined liver, spleen, kidneys, and testes or ovaries of individual rats, and the combined thyroids of six rats showed only 1 part or less per million of aluminium, amounts similar to those previously found by them and others in animals fed on aluminium-free diets. The rats appeared to be healthy and normally fertile.

In face of these facts and of a statement by the German Board of Health that no injury to health or indication of absorption could be found in dogs fed with aluminium hydroxide for over 12 months, it is difficult to attribute groups of symptoms, such as are described by Dr. LeHunte Cooper in a recent pamphlet,[5] to the use of aluminium cooking vessels, especially as the authors whose feeding experiments are quoted in support of his deductions from clinical observations are those whose work Tourtellotte and Rask have shown to be in error.

LATENT JUVENILE TUBERCLE.

Clinicians have often contrasted the relatively acute forms of pulmonary tuberculosis met with in adolescents and young adults with the chronic fibroid phthisis of middle life. Such a rough classification may serve a useful purpose if it emphasises the fact that the young are specially susceptible to the acuter manifestations and the more rapidly progressive forms of the disease. In these cases the patient's life may depend upon early diagnosis and immediate treatment. The adolescent suffering from early infiltration limited to a few lobules of one lung, and whose admission to sanatorium is delayed for a few weeks, will probably spend the waiting period wandering about the streets in a pathetic attempt to obtain the advantages of "fresh air," and may arrive at the institution with both lungs severely affected; but the life of a middle-aged working man whose lungs have been the seat of a smouldering infection for years will not be endangered on account of the length of a waiting list. It would, however, be a mistake to imagine that there are any age limits to the various types of pulmonary tuberculosis, for even among the young latent and sluggish forms of the disease are common. A girl in adolescence may acquire chronic fibroid phthisis of a type so indolent that no inkling of the true cause of a chronic malaise may arise until some increase in a cough, previously slight and intermittent, draws the practitioner's attention to the chest, a few sticky adventitious sounds or some slight irregularity in the breath sounds rouse his suspicions, and a skiagram shows extensive fibrosis of the lungs.

In the latent or sluggish type of tuberculosis in young people the problems of diagnosis, prognosis, and treatment are not easy to solve. Three French observers have discussed these problems anew.[1] Symptoms may be so slight that even the patient's mother may overlook them, there may be no loss in weight at a time when the disease is already firmly established in both lungs; even a progressive gain in weight is not unknown. The cough which is so marked a feature of the common forms of phthisis may be entirely absent for prolonged periods. A little "phlegm from the throat" in the morning does not suggest that anything is wrong with the chest. Should persistent lassitude drive the patient to her doctor's surgery a careful examination may reveal no physical signs of disease. The temperature is found to be normal, and a morning and evening record kept for a period of a week or more by the district nurse shows no evidence of fever. Finally, a sample of sputum, obtained with difficulty, is sent to the public health laboratory, and, to use the patient's formula, "no trace whatever of the disease is found." Yet if a skiagram is obtainable at this stage it may show unequivocal evidence of pulmonary fibrosis, calcifications, and even fibrous-walled cavities in one or both lungs. The difficulties of prognosis may be almost as great as those of diagnosis, for neither symptoms nor physical signs, nor even a single radiogram, may supply definite evidence whether the disease is still active and progressive. X ray examination may prove that calcification or dense fibrosis has taken the place of caseous matter in many areas, but as a rule shadows less intense than those cast by the above will leave interpretation in doubt. Obviously, if the disease has already been soundly healed by natural processes no treatment beyond the observation of the rules of hygiene is indicated, but if there is any evidence that complete arrest has not been secured the question of sanatorium treatment will call for consideration, and it may not be easy to decide if this should be recommended.

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[1] Münch. med. Woch., 1921, lxviii., 1082.

[2] The Lancet, 1931, i., 35.

[3] Biochem. Jour., 1931, xxv., 287.

[4] Amer. Jour. Hyg., July, 1931, p. 225.

[5] The Danger of Food Contamination by Aluminium. London: John Bale, Sons and Danielsson.

The Insurance Act provided for the sanatorium treatment of industrial workers. We have thus been able to observe the results of treating chronic fibroid phthisis in the form of the disease typically seen in middle-aged working men on a large scale. The results have been profoundly disappointing, though the sanatorium-colony where the patient is able to undertake carefully selected work despite his disease has met with a measure of success. Ordinary sanatorium treatment may cause temporary amelioration of symptoms in patients of this type, but it does not restore damaged lungs or working capacity. The young patient suffering from the form of disease we are considering resembles the middle-aged patient. The disease is not amenable to collapse therapy, the only form of active treatment which can be described as curative, and prolonged periods of sanatorium treatment are costly to the community and wearisome to the patient. A disease which has persisted for months or years, which has already resulted in permanent damage to the lungs, is unlikely to yield to a simple change in the manner of life of its victim. If, however, the opposing forces of the patient's resistance and the disease are almost balanced, a period in a sanatorium may suffice just to tip the scale and check the further spread of disease. Further, an appreciation of the true position can best be obtained by a period of observation in a sanatorium. During this period an investigation can be made which will include a search for constitutional evidence of active disease, particularly with regard to the patient's temperature at rest and after activity; serial skiagrams, to determine whether there is any change in the character and extent of the shadows; and a more complete search for tubercle bacilli in sputum and fæces. Microscopical examination of the sputum may not be sufficient to determine if tubercle bacilli are still at work. In the more active forms of tuberculosis the bacilli swarm in the diseased areas, and can be found in almost every sample of sputum examined. In the latent and sluggish forms the bacilli are often absent or difficult to find. Inoculation experiments with guinea-pigs may be necessary to determine their presence. If at the conclusion of these investigations no evidence of active disease is found, the patient may be discharged with the assurance that a normal if sheltered life may be resumed. If any evidence of active disease is forthcoming residence in the sanatorium may be prolonged for a further period, or the patient may be discharged to continue treatment on sanatorium lines under the care of her own practitioner at home.

READING IN HOSPITALS.

THE Dean of St. Paul's gave fresh impetus to the movement for hospital libraries in a whimsical address at the annual conference of the Library Association held at Cheltenham last week. He assessed the reading public at some 17,000,000 persons, each of whom on an average devoured 12 novels a year and would appreciate a supply of books when invalided. Lieut.-Colonel J. M. Mitchell, secretary of the Carnegie United Kingdom Trust, who occupied the chair, expressed a doubt whether public libraries as a whole had taken the part they might in providing books for patients in hospitals. There was no reason, he said, why men and women who were confined to hospitals should be deprived privileges which sick persons were granted in their own homes, and he promised the support of the Library Association in helping hospital authorities to develop an experimental service of books. Sir Bruce Bruce-Porter, who followed Dean Inge, remarked how vital to the sick is the companionship of books. There was, he thought, urgent need for recasting the side of hospital life dealing with the mental life of its inmates. He would set aside in each hospital a large room for a library which could also be used as a dining and reading room. The supply of books must, he thought, be organised on a national plan. Voluntary effort was good, but the post of librarian in a big hospital was onerous enough for a whole-time job. The helpers must be able to sense the type of book which would interest their patients and the librarian must have knowledge of the books he recommends in the same way as the physician should be fully acquainted with the composition of a medicine he prescribes. For a tuberculous patient, for instance, a book on the Brontë family, in which six children are portrayed as dying of consumption, would not be as suitable as the lives of Voltaire, Emerson, and Ruskin, who all lived to advanced age in spite of this disease. Later, at the summer school of librarianship in Birmingham, Colonel Mitchell expressed his pleasure that the hospital library problem was being taken up seriously by the Library Association, for he believed that quiet leisurely reading was among the most important of therapeutic agencies. Mr. C. E. A. Bedwell, house governor of King's College Hospital, frankly stated the conflict between the aims and ideals of hospital and library, but did not despair of its solution. It seems that some 2000 hospitals and institutions are already provided with books through the hospital library organised by the British Red Cross Society and Order of St. John, and Sir Arthur Stanley is now asking hospitals with 100 beds (or fewer) to contribute on the basis of a guinea a year for the use of the library, and larger hospitals to contribute two guineas. Many voluntary hospitals have agreed to subscribe on this basis, and appropriate grants have been voted by committees of the London County Council. So far, the whole of the hospital work has been done by voluntary librarians, but whether this will continue to be possible is doubtful.

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[1] Dufort, A., Angerany, J., Despergues, H.: Formes radiologiques de la tuberculose pulmonaire. Arch. Méd. Chir. de l'Appareil Resp., 1931, vi., 65.

ANNOTATIONS

INCIDENCE OF DISEASE AMONG DAIRY COWS.

It has been realised for some time that the average milking life of a dairy cow is short, and estimates varying between 2 and 5 years have been given. In view of the fact that a cow does not attain her greatest productivity until about five years after her first calving (and subsequently only declines slowly for several years) it is clear that milk carries a heavy economic burden in the wastage occurring among the cows which produce it. During the last few years attention has been directed to the seriousness of this problem of cow wastage and, as a first step in its attack, several schemes have been started which aim to measure, and to determine the relative importance of the factors responsible for, the losses from our dairy herds. In Scotland a committee was appointed to collect data, and they commenced operations in January, 1930; their scheme covered 490 milk-recorded herds, and an interim report issued by the Hannah Dairy Research Institute, Ayrshire, briefly summarises the causes of the disposal or death of some 3600 cows. In England wide inquiries have been undertaken at Cambridge and Reading, the former starting in October, 1928, and the latter in October, 1929; these two centres have been working in close touch and on identical lines. Others have also collected data on the question—notably Mr. W. Lawson in East Sussex and Mr. G. H. Garrad in Kent—and the results so far obtained by all English workers have been very consistent. In the following paragraphs the Scottish and the Cambridge (as typical of the English) figures are discussed; the methods of classification in these two cases have differed somewhat, but with a few minor adjustments the results can be presented in comparable form. The percentages of the total disposals accounted for by the various causes were as follows:—

—	Scotland.	Cambridge.	
		1928–29.	1929–30.
Normal causes—			
Sold as surplus stock ..	19·4	17·4	20·9
Poor milk yield	16·6	19·6	19·2
Accident	1·5	1·2	1·4
Old age	4·9—42·4	5·3—43·5	4·0—45·5
Disease—			
Failure to breed	17·2	23·7	26·8
Abortion	2·1	3·6	3·8
Udder diseases	15·0	7·0	4·7
Advanced tuberculosis and Johne's disease ..	5·4	10·4	9·6
Failure in tuberculin test	2·8	2·4	1·8
Miscellaneous	15·1—57·6	9·4—56·5	7·8—54·5
	100·0	100·0	100·0

The first four causes have been grouped together as above in the Scottish report, the idea being to separate them off from the definite wastage due to disease; in passing it is of interest to note the very small proportion of cows that live long enough to enter the "old age" group at their disposal. Under the next heading it is seen that sterility is easily the largest single factor causing wastage. Abortion appears relatively unimportant, but it must be remembered that some cows returned as sterile may really have aborted in very early pregnancy, or be suffering from the after-effects of abortion. These reproductive diseases together account for roughly 20 per cent. of the total disposals in Scotland, and as much as 30 per cent. in England. Udder diseases, on the other hand, are more common in Scotland than in England. Tuberculosis and Johne's disease have been put together in the table because it is probable that the two are often confused; this group is responsible for 10 per cent. of the total disposals in England, but only 5 per cent. in Scotland. Failure to pass the tuberculin test appears as a low cause of wastage, but it must be remembered that only about 15 per cent. of the cows are exposed to this risk—i.e., belong to tested herds. In the Cambridge data it was found that approximately 3 per cent. of the cows actually tested failed during the year—i.e., 1·5 per cent. at each of the six-monthly tests. From the statistical point of view, "miscellaneous" is an unsatisfactory grouping: it comprises, chiefly, cows that die at or just after calving, cows that die from unknown causes, and cows returned as suffering from "bad feet."

The Cambridge data cover approximately 13,500 cows belonging to 540 herds situated in the counties of Bedford, Cambridge, Hertford, Lincoln, and Norfolk. In the two years the total number of disposals was 2849 and 3165 respectively; these give an average disposal of 22·30 per cent. of the cows in the herds per year, from which it can readily be calculated that the average length of life, in one herd, of a dairy cow is very close to four and a half years. The average total milking life must be rather longer, as a proportion are sold in milk or in calf, and so presumably survive for some time in other herds. As near as it is possible to estimate, it seems that the average total milking life lies somewhere between six and seven years. Though the data discussed above have all been derived from milk-recorded herds, other information that is available indicates that the non-recorded herds would yield very similar results, were it possible to obtain data from them.

One point arises from the table on which it may be well to insist—namely, that from the farmer's point of view tuberculosis is relatively unimportant as a cause of wastage. This makes his strenuous and expensive efforts at its eradication the more praiseworthy, and shows that he realises the necessity of making his milk safe for human beings. It will probably be agreed that he should be given sympathetic help in order that the progress of recent years may be maintained.

THE PATHOLOGY OF MEASLES ENCEPHALITIS.

CONTROVERSY still centres on the nature of the encephalomyelitis which occasionally follows measles, and two recent papers throw some fresh light on it. F. Wohlwill in 1928 gave a clear description of the pathology in two cases in which he found as the chief lesion perivascular zones of demyelination in the brain and spinal cord. This description was soon after confirmed by investigations on the Continent and in America, as well as in this country. At present there is little question that the lesion is histologically very similar to that of post-vaccinal encephalomyelitis, and is not, at least in the great majority of cases, a hæmorrhagic encephalitis, as was at one time supposed. Undoubtedly the latter condition may also occur after measles, but since the characteristic perivascular demyelination of this form of encephalitis has been recognised the hæmorrhagic nature of the condition has fallen somewhat into the background. The report of a case from Paris by P. Lechelle, I. Bertrand, and E. Fauvert[1] reopens this question. Their case was complicated by thrombosis of the superior longitudinal sinus, and though they found the perivascular zones of demyelination described by other authors, these contained so much effused blood that they were inclined to attribute the destruction of the nervous tissues to hæmorrhage rather than to a neurolytic process. They did not think, however, that the hæmorrhage resulted directly from the sinus thrombosis, but rather that both were due to an encephalitic process. On the other hand, A. Ferraro and I. H. Scheffer[2] have lately published reports of the pathological examination of six cases of measles encephalitis in New York, two of which occurred in May and June, 1928, and four in March, April, and May, 1930. The lesions were almost the same in all, and consisted mainly of a perivascular demyelination with some destruction of axis-cylinders and proliferation of microglia. They consider that the lesion which they observed is "comparable to and even identical with" those which have been described in post-vaccinal encephalitis, and in the "paralytic accidents" of rabies vaccination. Whether it is a true inflammatory process or a special form of encephalopathy they leave an open question, since inflammatory cells are scanty in or even absent from the lesions. They incline to the view that this form of acute disseminated encephalomyelitis is a toxic reaction of the central nervous system developing in a number of different virus infections, but they make no attempt to explain the undoubted fact that this form of encephalomyelitis has become much more common of recent years.

BIOLOGICAL DATA.

WITH the completion of the six volumes of Tabulæ Biologicæ in 1930, the original purpose of this work was accomplished, but in order to keep such a comprehensive reference book up to date, it has been found necessary to issue supplementary volumes in the form of a quarterly journal, under the title of Tabulæ Biologicæ Periodicæ. We have before us[3] three of the four parts which go to produce the first volume of the supplement which is to form volume 7 of the original publication; it is to contain approximately 420 pages when complete. Subscribers to the original work are to receive the present volume at the reduced sum of R.M. 48. and to them the acquisition of this volume will be essential, while the possession of the earlier volumes will be indispensable to those who think of purchasing this volume. Many of the subjects comprised in this supplement are of the nature of additions to or amplifications of data contained in the original work, but, with the rapidly extending knowledge of the subject of biology, new sections have been added. To attempt to give a summary of the contents would be like describing the subject matter of a dictionary; suffice it to say that the needs of every branch of biology are well provided for. Thus while medical readers will find ample data on the vitamin, iodine, or mercury content of food materials, on experimental phonetics, or on the physiological effects of work or athletics, the pure physiologist will value the tables of physico-chemical constants of blood and tissue fluids, or the alcohol content of various organs of fowls exposed to an atmosphere saturated with alcohol—to take a few examples at random. For the plant cytologist there is an exhaustive list of chromosome numbers extending over 35 pages. References to the original sources of the data supplied are given throughout, and the work will be invaluable as a means of tracing those pertaining to every branch of biological science.

THE TIME OF CONCEPTION.

CONCEPTION is usually reckoned to take place on the actual day of cohabitation. There are, however, several factors which may cause appreciable delay between coitus and impregnation. Prof. R. Kräuter[1] points out that in order to give satisfactory answers to the questions, often put, of whether impregnation can occur at any time, whether there is a sterile period and whether there is an optimum period, it is necessary to know certain factors. These are the time taken for the spermatozoon to enter the cervix and find the ovum; the viability of sperm; the time of ovulation and the viability of the ovum. According to most authorities, the semen usually enters the cervix at or shortly after ejaculation and is distributed by the rhythmical contractions of the uterus, but delay may be caused if it is voided into the anterior vault or near the orifice of the vagina. The time the spermatozoa take to reach the ovum in the ampulla is not definitely established, but Lott calculated from their rate of chemiotactic movement—about 3·6 mm. per minute—that it would be between three-quarters of an hour and an hour. This may be extended by any cause of obstruction, but Birch and Hirschfeld have, according to Prof. Kräuter, demonstrated seed in the tubes 14 to 16 hours after coitus. Views on the viability of semen in the female genitalia are very varied, some authors holding that it lives only for two days, and one—Nürnberger—that it keeps its motility for a fortnight. It is, however, doubtful, as Prof Kräuter points out, whether a motile seed is necessarily still fertile. The time at which ovulation takes place is equally dubious, but from a symposium of observations Prof. Kräuter deduces that in a normal cycle of 28 days it may occur at any time between the seventh and the nineteenth days from the beginning of the menstrual period—most probably between the fourteenth and sixteenth days. He could find no record of ovulation in the last four days before a period. In qualification of these data, he reminds readers that ovulation may be much modified by various stimuli, such as disorders of menstruation, drugs, operations, and even possibly by coitus. It is, he says, agreed that the ovum enters the tube immediately, but its viability is a matter of speculation and is given by some writers as a few hours and by some as several days. Döderlein thinks it remains fertile for fourteen days.

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[1] Bull. et mém. Soc. méd. des hôp. de Paris, 1931, xlvii., 898.

[2] Arch. Neurol. and Psych., 1931, xxv., 748.

[3] Tabulæ Biologicæ Periodicæ. Vol. I. Edited, with the coöperation of a number of experts, by C. Oppenheimer and L. Pincussen. Berlin: W. Junk. 1931. R.M.55, or to subscribers R.M.48.

[1] Zeits. f. Arztl. Fortbildung, May 1st, p. 276.

So far as these observations go, it appears that coitus at any time between two periods may lead to conception. If it takes place immediately after menstruation, an early ovum may be fertilised or the seed may remain active until ovulation. If it occurs shortly before menstruation, however, it is not likely to lead to pregnancy, unless the ovum remains fertile for longer than is generally believed. Statistics quoted by Prof. Kräuter show that almost 50 per cent. of the conceptions in the group studied occurred in the interval, 41 per cent. in the postmenstruum, and 9 per cent in the premenstruum. But he does not define these terms exactly. Accurate figures are not easily obtained, and it may be noted that Knaus [2] insists that in the ordinary 26–30 day cycle conception is only possible between the eleventh and seventeenth days.

THE TREATMENT OF HÆMORRHAGE FOLLOWING PROSTATECTOMY.

THE respective merits of various methods of stopping hæmorrhage during and following operations for removal of the prostate were discussed last year at a meeting of the Section of Urology of the Royal Society of Medicine.[3] Mr. Kenneth Walker, who opened the discussion, had tried packing to stop oozing after the Freyer operation in earlier days but found it unsatisfactory owing to necrosis and the unpleasant state of the bladder when the packing was removed. Then he had tried hæmostatic bags, but these did not always control the hæmorrhage and often did not exert uniform pressure on the prostatic cavity. Mr. Walker said that he now preferred the open operation where possible, and did not spend long in trying to secure bleeding points deep in the prostatic cavity. If bleeding did not cease after placing the suture, he used light packing. In cases not suited for the open operation he used packing, leaving the pack in situ for six or seven days, and trusting to the frequent instillation of mercurochrome after its removal to clear up the sepsis. Mr. Swift Joly also praised the Thomson-Walker open operation, which gave more perfect hæmostasis than the earlier methods. In his experience the flavine pack gave pain and hæmorrhage was apt to follow its removal. Sir John Thomson-Walker explained that he himself did not prolong the operation by seeking bleeding points but packed round a catheter. He removed the packing in 48 hours, but replaced it if bleeding recurred. Mr. G. E. Neligan and Mr. Jocelyn Swan alone advocated the use of a Pilcher's bag to control hæmorrhage. These diverse opinions from British genito-urinary surgeons are of interest in view of a discussion held at the New York Academy of Medicine on post-operative treatment of urological cases, more especially cases of prostatectomy.

The opening paper of this discussion by Dr. H. G. Bugbee of New York is printed in the July number of the *American Journal of Surgery*. American specialists are apparently almost unanimous in their approval of hæmostatic bags. A few of those who took part in the discussion at the New York Academy of Medicine appeared to prefer the use of gauze packing but all agreed that the best method of dealing with oozing from the prostatic bed was by means of pressure rather than by an open operation that aimed at ligature of bleeding points. It must be borne in mind that the majority of those who took part in the American discussion were advocates of the two-stage operation in which a free exposure of the prostatic bed is difficult or impossible. A point on which American and British genito-urinary surgeons agree is the value of blood transfusion in diminishing the danger of post-operative hæmorrhage.

LIVER EXTRACTS FOR PARENTERAL USE.

THE satisfactory treatment of the pernicious anæmia syndrome is dependent upon adequate dosage of liver or its substitutes. In chronic cases Beebe and Lewis [1] have given as much as 3 lb. of liver a day and in certain instances even such large doses are without effect. There have therefore been repeated attempts to obtain some alternative and more effective method of administering the effective principle. Last year Cohn, McMeekin, and Minot described excellent results following the intravenous use of highly purified extracts, but the technical difficulties of preparation made such extracts impracticable for general use. Gänsslen then reported satisfactory results from treating a case of Addisonian anæmia, that had failed to respond to oral administration, with an intramuscular extract. French observers have also reported [2] a more rapid response to intramuscular injection than to liver by mouth, but unfortunately they gave no details of the method of preparation. In our own columns (1931, i., 857) Castle and Taylor showed that the original G fraction of Cohn, Minot, and their associates, which is the equivalent of certain commercial extracts for oral use, can with suitable care in preparation be satisfactorily administered by intravenous injection. The fraction contained a blood pressure reducing substance, but if given at a rate less than 4 c.cm. a minute, the effects were only slight and transitory. Strauss, Taylor, and Castle [3] have now also found that by a slight modification in preparation of the solution the same G fraction can be used as a basis for an intramuscular extract. The injection of the equivalent of 10 grammes of liver daily of such an extract gave a maximum reticulocyte response in typical cases of pernicious anæmia within five to seven days. They suggest that the extract necessary for a week's treatment when given by mouth may, if given by daily intramuscular injection, suffice for five to six months. Extracts for intravenous use were found to be 15 to 30 times as potent as the equivalent amount given by mouth. Further, certain patients responded to intravenous treatment after oral administration had failed. It is clear therefore that the active principle is more effective when given by parenteral injection than when given by mouth. The discrepancy adds support to Castle's original suggestion that failure of absorption of hæmatopoietic factors contained in the food or elaborated in the stomach is an important factor in the ætiology of the pernicious anæmia syndrome, especially those cases associated with chronic disturbances of the lower intestines and an apparently normal gastric function.

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[2] Quoted in Jour. Amer. Med. Assoc., August 8th, p. 408.

[3] See THE LANCET, 1930, i., 1185.

[1] Beebe, R. T., and Lewis, G. E.: Amer. Jour. Med. Sci., 1931, clxxxi., 796.

[2] Archand, C., and Hamburger, M.: Presse Méd., 1930, xxxviii., 1273; Aubertin, C., and Voillemin: Bull. et Mém. de la Soc. Méd. d. Hôp. d. Paris, 1930, liv., 749.

[3] Strauss, M. B., Taylor, F. H. L., Castle, W. B.: Jour. Amer. Med. Assoc., August 1st, p. 313.

CONGENITAL PYLORIC STENOSIS.

THE treatment of this condition in this country is now predominantly surgical. In his analysis last week (p. 526) of 18 cases at the Middlesex Hospital from 1919–30 Mr. C. MacLeod stated that only the first five were treated medically, the remaining 13 (all the cases since 1924) by Rammstedt's operation. And in introducing the discussion at the Eastbourne meeting of the British Medical Association, Mr. Max Page pointed out (p. 533) that this operation was accepted in this country as the treatment giving the best results. Other views were laid before the section on diseases of children at the recent annual gathering of the American Medical Association at Philadelphia.[1] Dr. Orville Barbour, who opened the discussion, held that spasm plays a part in almost every case of pyloric stenosis, and that this spasm can be relieved by irradiation. He applies what he calls a roentgenotherapeutic test to any case which does not respond to medical treatment within 48 hours. X rays are applied for three to five minutes to the upper part of the chest, when, if the obstruction at the pylorus is due mainly to spasm, the symptoms abate within 24 hours. If the obstruction caused by the tumour is extreme, little or no abatement occurs, but the patient is in a better condition to withstand operation than after a prolonged period of expectant treatment. While some other speakers at the American meeting were in favour of the irradiation treatment, which appears to produce its effects by a non-specific protein reaction stimulating the sympathetic nervous system, others supported the view that in all cases of true hypertrophic stenosis a tumour can be felt, and in most of them early operation is advisable. If after several attempts by trained observers a tumour cannot be found when other criteria are present, the case is probably one of pyloric spasm. It was admitted both at Eastbourne and Philadelphia that radiography is disappointing in the help it gives towards diagnosing between spasm and true stenosis. In America it is an axiom, generally attributed to Sauer, that the skill of the physician is the outstanding feature in the prognosis of pyloric stenosis. From what was said at Eastbourne, it would appear that once the diagnosis is made the outstanding feature in the prognosis is rather the skill of the nurse. Dr. Donald Paterson produced striking evidence of the great difference in post-operative mortality between private and hospital cases, due presumably to the fact that in a nursing-home a baby has the individual attention of special nurses day and night. Reviewing the two discussions, it is evident that the old controversy between advocates of medical and of surgical treatment is no longer acute. It is now agreed that when a definite tumour exists operation is advisable, unless the child had already passed the third month before the symptoms became acute. Medical treatment must be in accord with recent biochemical work. As Dr. Noah Morris pointed out at Eastbourne, babies with pyloric stenosis pass easily into a state of alkalosis; washing out the stomach with sodium bicarbonate solution and the administration of citrated milk are therefore unsafe. We hardly know whether irradiation is to be advised when a well-marked pyloric tumour is present, but the delay of 24 hours involved in Barbour's test is not serious, and further investigation might be made along this novel line. Opportunity to do so is likely to arise, as the malady seems to be on the increase in this country.

A NEW DISEASE.

UNDER the name of "Rift Valley fever" Drs. R. Daubney, J. R. Hudson, and P. C. Garnham describe[1] a fresh human disease which they have identified in Kenya. Like many other profitable things which have lately come to the student of infection, this new information arose from the investigation of veterinary subjects when the authors were asked to look into an excessive mortality among new-born lambs. This, they found, was due to some agent which would pass through a fine Chamberland filter. The condition is not contagious and there are fairly good reasons for suspecting a mosquito as the insect vector, though this point is not yet settled. The characteristic lesion of the disease in lambs is a focal necrosis of the liver, not unlike the condition found in yellow fever, with nuclear fragmentation and cytoplasmic "bodies." In adult sheep the disease is much less severe. It causes abortion and a moderate mortality in ewes and much the same in cows; other domestic animals appear to be immune. During the course of the investigation of the sheep, all the four Europeans involved developed a dengue-like fever, with rigors and severe pains about the joints, the whole attack lasting about four days. It was then found that most of the natives who had been in close contact with the original epidemic in the sheep had had similar attacks. Finally, a man was deliberately inoculated with the filtered plasma from an infected lamb which caused typical reactions in two sheep injected at the same time. He took ill in the characteristic way on the third day, and his blood proved infective to sheep for six days after his temperature rose but for no longer. We understand too that several persons have been infected while working at the disease in animals in this country, and there can be little doubt that we have an addition to make to the list of infections to which man is subject. It is perhaps of relatively little practical moment, but trivial diseases of limited geographical distribution such as this which are followed by a substantial resistance would afford excellent material for the investigation of immunological problems in man.

THE BIOLOGICAL METHOD IN PSYCHIATRY.

ALTHOUGH psychological medicine lends itself to philosophic treatment, general biological method is not always adequately used by psychiatrists who, in their zeal for either purely mental or purely physical categories of explanation, slip into a one-sided point of view, which leaves essentials of organic life, philosophically viewed, out of account. As a healthy corrective to this weakness, Prof. W. A. White opens his work on Medical Psychology[2] with a discussion of the meaning of "organism," and approaches this topic from the angle made familiar to us by Prof. Child in his conception of physiological and dynamic gradients. Having established biological premisses for argument, the author illustrates from biology the value of the concepts of Ambivalence and Conflict in all vital phenomena, so that the familiar occurring at a much later date may be attributed to the too early resumption of work after an illness.

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[1] Jour. Amer. Med. Assoc., August 15th, p. 455.

[1] Jour. of Path. and Bact., July, 1931, p. 515.

[2] Medical Psychology. By Prof. William A. White. Nervous and Mental Diseases Monographs, No. 54. New York: Nervous and Mental Diseases Publishing Co. 1931. Pp. 141. $3.

PREVENTION OF DISEASE.

Does not the fact that the increase in number of claimants has been mainly in claims of short duration and among younger insured persons, and the fact that the increase has been in the number of claimants per cent. of society members (§ 17 of the memorandum) tend to show that more advantage is now being taken, especially by the younger insured persons, of the facilities provided for them by the Act? They come earlier, more often, and for slighter complaints, thus perhaps preventing more serious illnesses, and incidentally longer claims. Is not the Act in this way fulfilling one of its objects, about which we hear too little—the prevention of disease? The benefits of the treatment of such conditions as septic foci, which may not render an insured person incapable of work, will be apparent in later years.

The tendency of persons incapable of work, who would not have claimed in earlier years, to claim under present conditions is regarded as a large factor in the increase. There is also a tendency on the part of insured persons to make full use of certificates obtained instead of adhering to their previous attitude of indifference to them, which often resulted in certificates being either refused, torn up, or allowed to lie about at home or in the pocket and thus rendered valueless.

RECOMMENDATIONS.

Study of the memorandum finally leads the Paddington section to make the following suggestions:—

1. To recast the actuarial basis and of sickness benefits according to the health categories and statistics of the various classes of insured persons.
2. To instruct the medical student in health insurance practice.
3. To deal with each case on its merits in the spirit of Article 3 of the N.H.I. (Medical Benefit) Amendment Regulations, 1930.
4. To promote a due sense of professional responsibility in certification, among those in whom it is at present lacking, by general discussions (§ 61 of the memorandum) within the profession.
5. To deal with cases involving negligent or false certification, for purposes of administrative inquiry, through the panel committee and the regional medical staff, and, for purposes of disciplinary action or penalty, through the General Medical Council.
6. To submit any document which reflects on the efficiency or good faith of insurance practitioners before issue to the representatives of the profession for their comments.

COST OF MEDICAL SERVICE IN 1930.

The twelfth annual report of the Ministry of Health which has just appeared (Cmd. 3937. 5*s.*) gives the extent and cost of the insurance medical service in 1930. In England 14,700 doctors were in insurance practice. Medicines and appliances were supplied as part of medical benefit at about 9000 chemists' shops. The number of insured persons entitled to medical benefit was nearly 14,500,000. Medical benefit cost over £8,862,000. Of this sum insurance doctors received over £6,447,000 in respect of their duties of attending and treating insured persons; and £1,927,700 of the balance was paid to insurance chemists for the supply of drugs and appliances. The remainder was expended in adjustments of the main finances of medical benefit to various special conditions arising under the Act, or in the circumstances of insurance practice.

About £200,000 was paid to country doctors on account of mileage, the payments being so calculated as to take account both of distances covered and of the difficulties of locomotion in certain areas which would make distances by themselves an inadequate measure of demands upon doctors' time and energy; nearly £10,000 was set aside to enable country doctors to attend courses of post-graduate study, and to provide them with facilities such as maintenance of telephones, motor-cars, and branch surgeries, or reasonable vacations; doctors received about £196,000 for medicines and appliances supplied by them personally, and for medicines dispensed by them in country districts where patients are out of reach of chemists; and, finally, sums of about £74,000 and £7500 were paid on account of the small numbers of insured persons who exercised their option to obtain treatment, including medicines, through approved institutions, or, with the consent of insurance committees, to make their own arrangements for medical treatment.

On April 1st last 926 insurance practitioners were under agreement with Welsh insurance committees. Of these 29, or 3 per cent., were medical women, representing about 20 per cent. of the registered medical women resident in Wales. The medical men participating in insurance practice were about 55 per cent. of the registered medical men in the country. The central practitioners' fund available for remuneration in Wales amounted in 1930 to £399,229, plus £38,300 allocated in respect of mileage, and £590 to meet certain difficulties in providing medical treatment in rural areas. Medical benefit and administrative expenses together amounted during 1930 to £579,924, as compared with £585,031 in 1929.

THE SERVICES

ROYAL NAVAL MEDICAL SERVICE.

Surg. Comdrs.: O. D. Brownfield to *Egmont*, for R.N. Hospital, Malta; and C. M. R. Thatcher to *Victory*, for Haslar Hospital. Surg. Lt.-Comdr. J. M. Sloane to *Vivid*, for R.N. Hospital, Plymouth, and to *Keppel*. Surg. Lt.-Comdr. (D) E. R. Longhurst to *Maine*. Surg. Lts.: G. Rorison to *Pembroke*, for R.M. Infirmary, Deal; E. W. Graham to *Adamant*; H. G. Wells to *Godetia*; and D. C. Drake to *Enterprise*. Surg. Lts. (D): L. F. Fairey to *Devonshire*; H. V. Pell to *Victory*, for R.N. Barracks, Portsmouth, and to *St. Vincent*; and L. V. Donegan to *Pembroke*, for R.N. Barracks, Chatham.

Surg. Lt. R. W. Mussen to be Surg. Lt.-Comdr.

Surg. Capt. J. McCutcheon placed on Retd. List.

ROYAL NAVAL VOLUNTEER RESERVE.

Surg. Lt.-Comdr. H. M. Petty, Surg. Lts. A. P. Trimble, D. M. Dean, and Surg. Sub-Lt. R. W. Riddle to *Victory*, for Haslar Hospital. Surg. Lt. (D) R. Symmons to *Vivid*.

ROYAL ARMY MEDICAL CORPS.

Basil Blewitt to be Lt. (on prob.).

MILITIA.

Maj. R. MacKinnon retires on attaining the age limit, and retains the rank of Maj.

TERRITORIAL ARMY RESERVE OF OFFICERS.

Capt. D. C. Graham, from Active List, to be Capt.

INDIAN MEDICAL SERVICE.

The undermentioned officers retire: Col. J. Fuller-Good and Lt.-Col. E. C. Hepper.

Capt. A. S. Arora relinquishes his temp. commn.

ROYAL AIR FORCE.

Group Capt. H. W. Scott to No. 21 Group Headquarters, West Drayton, for duty as Senior Medical Officer.

SPECIAL ARTICLES

NOTES FROM INDIA.

(FROM OUR OWN CORRESPONDENT.)

OPIUM AND ALBUMINURIA.

THE Calcutta School of Tropical Medicine is investigating the effect of opium on albuminuria, having regard to the general impression that patients suffering from kidney disease stand this drug badly. There appears to be no experimental basis for this belief, but it has been argued that the administration of opium or its alkaloids is inadvisable in nephritis, if only because they lessen intestinal movements, apart from any question of direct action on the kidney. Lieut.-Colonel R. N. Chopra, I.M.S., and Dr. J. P. Bose, however, approaching the question with an open mind, did not admit[1] that any adequate reasons were forthcoming for depriving patients suffering from chronic kidney disease of the relief from pain or distressing cough or pain afforded by opium. They proceeded to try the effect of small or medium doses on a series of hospital cases, some suffering from chronic nephritis of the parenchymatous type, some with ascites, and all with albumin in the urine indicative of damage to the kidneys. The patients were put on a diet of known food value, and the amount of fluid was kept as constant as possible. The daily output of urine and albumin was measured and charted. Opium was given in gradually increasing doses in the form of a mixture, the initial dose being gr. 1 daily, gradually increased to 4 or 5, or in some cases to grs. 8 or 9 daily. Contrary to expectation, in almost all cases there was an appreciable increase in the quantity of urine passed, and in none was the daily output diminished below the average normal. This was attributed, not to direct action on the kidney, but to diminished peristalsis increasing absorption from the gut. The quantity of albumin showed a decrease in most cases; in some it disappeared. There was no evidence, either in increase of albumin or casts, of further damage to the kidney. The blood-sugar in most cases remained constant as before. The general condition of most of the patients improved, but in two slight symptoms of uræmia developed. The number of cases dealt with was only 12, and renal function tests were for some reason considered impracticable The further investigations promised will be awaited with interest.

SELF HELP.

In a report issued jointly by the Dufferin Fund, the Victoria Memorial Scholarship Fund, and the Lady Chelmsford All-India League, is an account of the inquiry into maternal and infant mortality now being carried on by Dr. Margaret Balfour and her colleagues in various parts of India. This inquiry is complicated by social and religious customs, and by the geographical distribution of various diseases of pregnancy, such as eclampsia, anæmia, and osteomalacia. Certain broad facts indicate directions in which effort can be profitably put forth. A series of 200 cases of stillbirth and early infantile death have recently been examined in Bombay, Calcutta, and Madras. Of these, the complications of labour comprised the largest single group, accounting for 19·5 per cent. Antepartum hæmorrhage provided 13·5, and the toxæmias of pregnancy 15·5 per cent. Only 10·5 per cent. of the deaths were put down directly to tropical diseases, those figuring chiefly being malaria, anæmia of pregnancy, and dysentery. The incidence of syphilis was 14·5 per cent., or including probable and possible cases 18·5 per cent. It is noted that whereas women of the hospital classes in Glasgow gave 9 to 10 per cent. of positive Wassermann reactions, series of women examined in Bombay, Madras, and Calcutta gave 13·6, 12·5, and 13·4 respectively. Out of a total of 144 placentas examined, no fewer than 57 showed evidence of gross disease or abnormality, and 5·5 per cent. of the deaths were accounted for primarily by diseases of the placenta. Much of the report of the Scholarship Fund is devoted to the question whether or not it is desirable to utilise the services of *dais* (the illiterate midwives of the country) for maternity work. By general agreement these women, in their original state, are dirty and dangerous, and it is difficult to imbue them with even the most elementary ideas of cleanliness and efficiency. In some localities, however, an attempt at training has been made by enthusiastic workers, with a considerable measure of success. The work of educating them may be distasteful and unsatisfactory, but there is no practicable alternative. Properly trained midwives are not likely to be available for many years to come, apart from the difficulty of prevailing on them to reside in isolated situations. The cognate scheme for training schoolteachers to render elementary medical and surgical aid in the villages is advancing rapidly in many districts. It certainly seems wise to avoid utilising the *vaids* and *hakims* for this purpose when literate substitutes are readily obtainable. And it is evidently with reluctance that women doctors have at length decided to endorse comprehensive schemes for the training of indigenous *dais*.

UNITED STATES OF AMERICA.

(FROM AN OCCASIONAL CORRESPONDENT.)

DIFFERENTIAL FERTILITY.

A STUDY of fertility according to geographic areas in this country has been made for the division of research of the Milbank Memorial Fund, and is published in their latest Quarterly Bulletin. Race, social class, and urbanisation, each known to affect fertility, were held constant for each area. In the East the fertility-rate of women on farms is found to be about 50 per cent. higher than that of women in cities. In the West the farm women are 75 per cent. more fertile. Women of the "white collar" class have a higher fertility in the West (except in California) than in the East. Among women of the labouring class this distinction is not found. In fact, the highest fertility among women of this latter social grouping is found in New Jersey and Pennsylvania. The labouring class is more fertile in all areas than is the "white collar" class. It is suggested that further research be made to determine what are the social factors responsible for the higher fertility in Western areas and for an observed tendency toward stabilisation of fertility in urban areas.

THE BROAD TAPEWORM.

As long ago as 1907 Stiles foretold that infestation with *Diphyllobothrium (Dibothriocephalus) latum* would become endemic in North America, as it already is in Japan and on the coast of the Baltic and the great

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[1] Ind. Med. Gaz., June, 1931.

African lakes. Infested fish have been found in Northern Minnesota, the Portage Lake region of the State of Michigan, and in the vicinity of Winnipeg. This tapeworm undoubtedly has been introduced by immigrants from Northern Europe. During the last five years Thomas B. Magath and Hiram E. Essex, of the Mayo Foundation, have made a detailed investigation of the waters of Minnesota and the neighbouring territory of Canada, and have tabulated and plotted their findings in a contribution to the *Journal of Preventive Medicine* for July. More significant than their actual discoveries of plerocercoids are the observations they have made upon the life cycle of this helminth under natural conditions. Much emphasis has been laid in the past upon the importance of dogs and certain wild mammals as natural reservoirs of infestation. Magath and Essex give reasons for believing that human sewage is of far greater importance. Of eggs from human sources, 80 per cent. developed active coracidia. The percentage of active coracidia developed from eggs taken from the fæces of dogs was only 1·5. Moreover, drying is found to destroy the embryo, which would still further reduce the significance of canine fæcal matter. These conclusions are confirmed by observation; for heavy infestation is associated not with the presence of dogs upon the shore, but with the discharge of raw sewage from communities where the habit of eating raw fish has been shown to persist. It would appear probable that the control of infestation is reasonably attainable, and that a major part of the programme of rational control would consist in chlorination of raw sewage from infested communities.

SANITARY DRINKING.

The Women's Bureau of the Department of Labour has just published a study of the laws governing the installation of drinking facilities and the present standards in 21 States. They feel justified in making this piece of public health research by the instruction received from Congress that they are to formulate standards to improve working conditions for women. After supplying ample evidence that a drinking fountain should have an inclined and not a vertical jet, and that the orifices of the jets must not be accessible to the mouths of drinkers, the Bureau's publication [1] shows that many old-fashioned insanitary types of drinking fountain are not only in use, but are still being installed. Among 1500 places of employment studied, only 4 per cent. had sanitary fountains for all their workers. Less than 15 per cent. had any drinking fountains of a satisfactory type. Investigation of the State laws shows that only 17 States definitely recommend that angle jet fountains be used in preference to the vertical jet type.

BERLIN.

(FROM OUR OWN CORRESPONDENT.)

THE TREATMENT OF PUERPERAL FEVER.

Dr. Ziegler reports the result obtained in the treatment of puerperal fever in the gynæcological department of the Virchow Hospital with a new compound, euthagen, said to be a silver salt of thiozellobiose. The special feature of that compound is that the silver salt when it comes into contact with the blood plasma is very slowly dissociated, so that it can act on the blood over a considerable time. The preparation was used in 44 cases, of which 5 died within the first five days; in 11 cases the septicæmia was complicated by endocarditis and peritonitis, and euthagen could not be expected to give good results. Eighteen of the remainder recovered, whilst in 10 cases the drug proved useless. The women when conveyed to the hospital had all had several rigors with very high temperatures, and were in a very bad condition. Intravenous injections of 5 c.cm. of a 5 per cent. solution of euthagen were given every other day. In some cases which were eventually cured 100, 80, and 60 c.cm. of the compound had been administered The injections produced neither pain nor thrombosis. The remedy appears to be worth a trial, since the results recorded above were obtained in patients who seemed to be in a desperate condition when they reached hospital.

THE EFFICACY OF MEAT INSPECTION.

The efficacy of meat inspection has recently been discussed in the lay press in connexion with an alleged increase of trichinosis in this country. Prof. Bongert, of the Berlin Veterinary College, stated, in reply to the attacks on meat inspection, that from 1925 to 1929 only 129 cases of trichinosis were notified in Germany with 16 deaths. In 1930 alone there were 95 cases with 11 deaths, the increase being due to an epidemic in Stuttgart traced to the consumption of bear-ham, which is not subject to inspection. During recent years 7,000,000 pigs had been inspected in Berlin by the Government meat inspectors; 70 of these were found to be infested, and might have caused epidemics if not condemned. Between 1905 and 1911 one pig out of 14,000 showed trichinæ, but in 1930 only one out of 67,000, notwithstanding the importation of foreign pigs. In cases where trichinosis has occurred after the consumption of pork it must have been due to a deficient inspection. The importation of tinned meat from abroad being illegal, the risk of disease from meat consumption is very small in this country.

EXAMINATION OF ICE-CREAM.

In the city of Magdeburg, paratyphoid fever having become rather prevalent, the ice-cream sold on the streets has been subjected to examination by the municipal health authorities. The head of the department concerned, Dr. Schäde, reports that 31 samples were received and showed from 1000 to 280,000 bacteria per c.cm. No paratyphoid bacilli were found, but only lactic acid bacilli, *Bacillus proteus*, and innocuous streptococci; in some samples *B. coli* was also present. The ice-cream was found to consist of milk, sugar, fruit juice, and owing to the large quantity of bacteria present fermentation took place at a temperature as low as 6–8° Centigrade. Dr. Schäde points out that of all countries Holland alone insists on the routine inspection of ice-cream. There no ice-cream may be sold having more than 100,000 bacteria per c.cm. He suggests that a similar law should be enforced in Germany.

LYMPHOGRANULOMATOSIS.

Attention is again being drawn to the morbid condition known as lymphogranulomatosis, described by Dr. Frey, on which I commented last year.[1] In the department for skin diseases of the Virchow Hospital 51 cases have been under the observation of Dr. Lobe and Dr. Blummer; in 49 of them the Frey test was positive. In the course of the illness a swelling of the inguinal and iliac glands develops.

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[1] Correll, Marie: Sanitary Drinking Facilities, Bull. of Women's Bureau, No. 87. Washington, 1931. 10 cents.

[1] See THE LANCET, 1930, i., 937.

Lymphocytosis is a constant symptom. In many cases an exanthem in the form of urticaria or of a maculo-papular rash. The authors observed good results following intracutaneous injections of tuberculin. Operative removal of the glands takes a long time, the wounds healing badly, while radiotherapy gives no result.

MALARIAL INFECTION OF SYPHILITIC INFANT.

Dr. Schadow, of Hamburg, has recently described a case where a woman suffering from general paralysis treated by induced malaria gave birth to an infant in the eighth month of her pregnancy. No clinical symptoms of syphilis were present in the infant, but since the Wassermann reaction was positive the infant was treated with inunctions of mercury iodide ointment. Three weeks later pyrexia developed in form of tertian ague, the infant became gravely ill, the spleen being greatly enlarged. Examination of the blood showed a severe anæmia and the presence of malaria plasmodia. After administration of quinine and two transfusions of blood the infant recovered, and when seen after a year was strong and healthy.

THE ROBERT KOCH ANNIVERSARY.

In 1932 fifty years will have elapsed since Robert Koch discovered the tubercle bacillus, and plans are being made to celebrate his memory. The Robert Koch Fund for scientific research which had dwindled almost to extinction through the inflation of our currency will be revived. President Hindenburg has declared his readiness to become patron of the celebrations, which will take the form of a meeting at which foreign as well as German scientific men will be invited to deliver addresses, and the Chancellor will be honorary president.

SCOTLAND.

(FROM OUR OWN CORRESPONDENT.)

THE REGIUS CHAIR OF FORENSIC MEDICINE, GLASGOW.

THE resignation of Prof. John Glaister, M.D., Regius Professor of Forensic Medicine in the University of Glasgow, takes place on Sept. 30th. He has held the chair since 1898, having previously held a chair of medical jurisprudence and public health at St. Mungo's College, Glasgow. His whole life has thus been spent in the furtherance of medico-legal knowledge, and his classical text-book on the subject has reached a fourth edition. As medical referee for industrial diseases in six counties in Scotland, and as medico-legal examiner in Crown cases, Prof. Glaister has exercised a profound influence on the development of his subject, which extends throughout the British Empire. It is appropriate that the vacancy caused by his resignation, at the age of 75, should have been filled by the appointment of his son who has specialised on the same lines. John Glaister, jun., M.D., D.Sc., has been professor of forensic medicine in the University of Egypt, Cairo, and medico-legal adviser to the Egyptian Government since 1927. He qualified in 1916, and from 1916–19 served with the Royal Army Medical Corps. After the war he was appointed assistant to the professor of forensic medicine at Glasgow University. He qualified as barrister-at-law of the Inner Temple, London, and was called to the Bar in 1925.

Dr. Glaister has made numerous contributions to medico-legal literature, of which the most recent is a substantial work, published in Egypt this summer, entitled "A Study of Hairs and Wools." This book, which is profusely illustrated, embodies the results of his researches, extending over many years, on the medico-legal aspects of its subject.

A NEW HOSPITAL AT RHYNIE.

The late Dr. P. Nicoll, of Stratford, E., bequeathed £5000 for the establishment of a hospital for his native place, Rhynie, in North-west Aberdeenshire. The bequest was supplemented by gifts in money and kind, and the building was recently opened by the Duchess of Richmond and Gordon. It consists of four double and two single wards.

SUNDAY TENNIS IN HOSPITALS.

The resident medical staff at Stobhill Hospital, Glasgow, have asked permission to play tennis at that institution on Sundays after 2 P.M. The Glasgow Corporation Subcommittee on Institutions, by four votes to three, refused to recommend that the permission be granted, and the Health Committee finally refused the request by eleven votes to nine.

INFECTIOUS DISEASE

IN ENGLAND AND WALES DURING THE WEEK ENDED AUGUST 29TH, 1931.

Notifications.—The following cases of infectious disease were notified during the week: Small-pox, 33; scarlet fever, 1452; diphtheria, 750; enteric fever, 63; pneumonia, 341; puerperal fever, 31; puerperal pyrexia, 97; cerebro-spinal fever, 24; acute poliomyelitis, 14; acute polio-encephalitis, 1; encephalitis lethargica, 12; dysentery, 9; ophthalmia neonatorum, 122. No case of cholera, plague, or typhus fever was notified during the week.

The number of cases in the Infectious Hospitals of the London County Council on Sept. 1st–2nd was as follows: Small-pox, 33 under treatment, 2 under observation (last week 27 and 0 respectively); scarlet fever, 1091; diphtheria, 1351; enteric fever, 15; measles, 132; whooping-cough, 377; puerperal fever, 22 (plus 15 babies); encephalitis lethargica, 214; poliomyelitis, 8; "other diseases," 89. At St. Margaret's Hospital there were 16 babies (plus 10 mothers) with ophthalmia neonatorum.

Deaths.—In the aggregate of great towns, including London, there was no death from small-pox, 1 (1) from enteric fever, 6 (0) from measles, 1 (0) from scarlet fever, 19 (3) from whooping-cough, 30 (6) from diphtheria, 39 (9) from diarrhœa and enteritis under two years, and 15 (2) from influenza. The figures in parentheses are those for London itself.

Two deaths from whooping-cough were reported from each of Liverpool, Bradford, and Hull. Liverpool reported 9 fatal cases of diphtheria, Hull 2. Diarrhœa was credited with 5 deaths at Liverpool, 4 each at Nottingham and Leeds, 3 at Hull.

The number of stillbirths notified during the week was 205 (corresponding to a rate of 38 per 1000 births), including 49 in London.

KING GEORGE HOSPITAL CONTRIBUTORY SCHEME.—This new Ilford hospital is about to establish a contributory scheme on the basis of a weekly payment of 2*d*., supplemented by an employers' quota. The limits of the qualifying weekly income will be: single men or women, £4; married, without children, or with children over 16, £5; married, with children under 16, £6.

A NOISE SILENCER FOR HOSPITALS.—Several New York hospitals are said to be installing a new device for excluding noise which has been invented by Mr. Hiram Maxim. The apparatus consists of a box a foot wide and 10 inches high. It is placed on a window-sill and the window closed down to the top of the box, and although a large volume of air is admitted outside sounds are so completely excluded that even the noise of a pneumatic drill is unheard. The apparatus itself makes a noise comparable to that of an electric fan.

the medical staff of the Council under the direction of the principal medical officer may be called upon to serve any committee. A principal sister has administrative responsibilities over all the outdoor nursing staff of the corporation, including health visitors, home nurses, and school nurses. Towards the end of 1929 several school clinics were made available for pre-school children, and nursing and expectant mothers were admitted to the dental clinics. In the future a joint clinic at the Municipal Hospital at Southmead will serve as a centre for inspection and treatment of minor ailments of school-children and infants under 5; infant welfare clinics and a school for mothers; and antenatal clinics as well as dental, ophthalmic, and ear, nose and throat clinics. New developments in school work include the extension of the scheme for immunisation against diphtheria. Children are now inoculated in the schools instead of at the clinics. In March a clinic was opened at Southey House, College Green, for the investigation of "difficult children," and a certain number of delinquents has also been investigated. The clinic is under the direction of Dr. A. Dalby, who has the assistance of a school nurse for the investigation of environmental conditions; economic conditions have hitherto prevented development of this clinic along definite "child guidance" lines. The opening of the new Winford Hospital with 60 beds for prolonged treatment of cripples and heart disease has extended the good work being carried on under the rheumatic and orthopædic schemes. In nine years the number of cases of ringworm of the scalp have been reduced from 183 to 8 by the use of X rays, under the direction of Dr. F. C. Bergin. Major C. P. Rea, superintendent of physical instruction, regrets that no steps have yet been taken in private schools to bring the physical training more into line with the requirements in council schools. Children entering council schools after a period in private schools are often found to be handicapped through lack of knowledge and poor physique. The provision for exceptional children in Bristol is good, though accommodation for epileptics is, as elsewhere, difficult to find.

County of Nottingham.

Dr. C. Tibbits sets out the shortcomings of the school medical service in the county before chronicling the directions in which progress has been made. He admits, for example, that ascertainment of mental defect must be incomplete, since his service has found only 3 per 1000 of the children to be mentally defective, and it is improbable that Nottingham is particularly favoured in the mental capacity of its school population. Dr. Tibbits believes that in rural areas many cases of aural discharge remain untreated; special sessions in clinics, supplemented in rural areas by a travelling van, are needed. He regrets the lack of accommodation for epileptics, and for the delicate children who would benefit from education in the open air. The needs of the rheumatic child are not yet fully met. In other directions considerable advances have been made. All the treatment schemes are working well, the provision of spectacles having been facilitated, while the new complete dental scheme has been so keenly appreciated by parents that acceptances of treatment have risen to 65 per cent. A comparative table for Nottingham and for England and Wales shows how vigorously dental treatment is being tackled in this county. The scope of the dentist's work is to be increased by retaining in the scheme children whose parents previously refused treatment. An attempt to secure the routine medical inspection of pre-school children is being made. Valuable special inquiries include: a detailed analysis of the present conditions of 35 children who have received in-patient orthopædic treatment and have now left school; a record of the successful treatment of otorrhœa by flavine in glycerin, by Dr. C. W. Jeremiah; a record of the treatment of otorrhœa by ionisation, by Dr. J. Ferguson, whose results in certain cases are even more encouraging. Both authors point out that either of these newer methods is superior to the instillation of hydrogen peroxide.

City of Nottingham.

Dr. A. A. E. Newth says of developments in the school medical service that while some of them are intentional steps and others the results of the growth of scientific knowledge, many others are a response to the demands of teachers and parents.

"It is no part of our work to provide treatment that can be supplied more economically and efficiently by other activities, such as private practitioners and voluntary or public institutions. But where it is found that for various reasons—such as poverty, procrastination or indifference on the part of the parent, lack of accommodation in the homes or hospitals, or of the necessary medical organisation—this essential treatment is not otherwise obtainable, then it is our duty not only to ascertain the defects but to supply the remedies, and to follow up the cases afterwards to make sure that the treatment has been effective."

It is well that these facts should be recalled, since there are still some people who think that there is an inevitable opposition of interest, whereas in reality not only does the national health benefit but actually the increased attention drawn to health matters must lead the parents to seek more advice from their own doctors. The coöperation of all branches of the medical profession is for the good of all, and Dr. Newth specifically adds: "To an increasing extent the school medical service receives the courteous assistance and interest of private practitioners, and of the honorary and resident staffs of the hospitals and dispensaries. In this way the children are enabled to receive the fullest benefit from the medical facilities that are available." An outstanding feature of the past year was the opening of the Leen Side clinic to replace the old treatment centres at Hollowstone and Eastcroft. Of the cases summoned for examination by the surgeon-aurist, 82·3 per cent. attended, compared with 61·7 per cent. in 1929. Probably a factor in the popularity of this department is appreciation of the conservative methods of treatment adopted and of the critical attention given to each patient. Of the cases examined by Mr. H. B. Tawse, the surgeon-aurist, only about 50 per cent. were recommended for operation, the remainder were referred for further observation. Every child summoned for the first examination by the surgeon-aurist is now seen also by the dentist, and, if necessary, treated. The percentage of defects cured in the orthopædic department has greatly increased, while the period of treatment has been reduced. The effective method of dealing with ringworm has reduced the total loss of school attendance from 64,583 days in 1913 to 3678 days only last year. New fields of activity include the supervision of cases of rheumatism and heart disease under the general direction of Dr. J. W. Scott, as part-time consultant physician, and the examination of juvenile delinquents. The lack of a special school for physical defectives is one of the few gaps in a well-organised system; 461 cripples still attend ordinary elementary schools. Excellent features of this report are the section written by the organisers of physical training, a special record of an outbreak of diphtheria, with suggestions for control, and a brief, but judicial, account of some results of ultra-violet ray treatment by Dr. A. J. Davies.

THE SEAMEN'S HOSPITAL.—In 1930 there were 6576 in-patients and 26,167 out-patients; the income was £99,065, and the expenditure £106,241. The board has decided to provide a women's ward of 25 beds, and a children's ward of 20 beds in the Dreadnought, primarily for the dependents of sailors. The hospital will then be recognised by the General Nursing Council as a self-contained school for nurses who will no longer be obliged to take part of their training in a hospital for women and children; the length of their training will thus be reduced, by six months, to three years. The Seamen's Hospital Aid Committee has endowed a twelfth bed at the Dreadnought, making a complete ward.

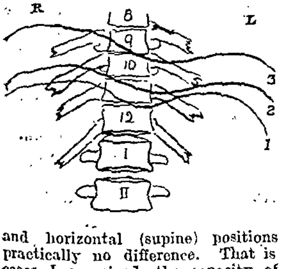
CORRESPONDENCE

THE LEVEL OF THE DIAPHRAGM.

To the Editor of THE LANCET.

SIR,—In my friend Sir Charlton Briscoe's interesting paper on the mechanism of the inflation of the lungs, in your last issue (p. 513), I note he still holds that when a subject lies down the diaphragm at once rises in the chest to such a degree that the respiratory capacity is materially decreased. On this belief he bases theories with which I am not concerned. I am however entirely convinced that this fundamental hypothesis is incorrect. As pointed out elsewhere (*Brit. Jour. Radiol.*, vol. iii., pp. 295–303, and vol. iv., p. 299), I maintain that the accepted teaching as to the behaviour of the diaphragm when a subject lies down is incorrect, in spite of the descriptions given in Gray's Anatomy (eighteenth ed., p. 442). Many observations, largely on healthy medical students, indicate that there is comparatively little change in the normal position of the diaphragm between the upright and horizontal positions. Nature provides an automatic compensatory mechanism so delicate that, even if we go to extremes and invert a subject head downwards, the diaphragm is found at approximately the same level.

In recording the position of the diaphragm it is essential for the X-ray tube to be accurately centred for each observation. Moreover skin marks are entirely untrustworthy, for when the recumbent posture is assumed, the skin moves very considerably in relation to the vertebral levels, even in thin subjects. On the anterior chest and abdominal walls this is well recognised, but it is not appreciated that a metal disc attached to the skin over the spinous processes of the vertebræ may be found fully one and a half inches higher in the recumbent than in the vertical position. Skin marks are therefore totally unreliable. Accurate records can only be obtained from radiograms showing the vertebræ. Records must not be made in the prone positions, for if the subject lies face downwards there is, of course, pressure on the abdomen and the diaphragm will, naturally, be found at an abnormally high level.



In the paper already quoted I reproduce tracings of the extremes of inspiration and expiration in the vertical and horizontal (supine) positions and there is practically no difference. That is to say, in the cases I examined, the capacity of the diaphragm to move was just as free in the horizontal as in the upright position. Moreover, the actual range, in relation to the vertebræ, was virtually identical. The accompanying Figure shows the diaphragm "at rest" in an average subject, a laboratory attendant 25 years of age, in its correct relationships to the vertebræ. The outlines are traced from radiograms in which the tube has been correctly centred and exposed in the mid-phase of respiration with the subject (1) standing, (2) lying supine, (3) lying prone. It will be noted that in the prone position (3), the diaphragm is very high in the chest, as high as in the maximum of forced expiration. In such circumstances, one would expect some embarrassment of respiration due to diminished capacity. It is due of course to the transmitted pressure on the diaphragm from the abdominal wall. Our own sensations tell what is happening, especially if we try lying face down after a heavy meal.

When we compare the ordinary positions of the diaphragm in the vertical and horizontal positions, (1) and (2), we note that there is approximately only half an inch difference and this is about the maximum that we find. Quite frequently no difference at all is noted. If, as Sir Charlton maintains, there is a marked diminution in the capacity of the lungs when the subject lies down, some other explanation of this contention must be found, for only a fractional part of it would appear to be due to the altered position of the diaphragm in the chest.

I am, Sir, yours faithfully,

Cambridge, Sept. 7th, 1931. A. E. BARCLAY.

DR. R. M. BUCHANAN'S WORK ON *BACILLUS TYPHOSUS.*

To the Editor of THE LANCET.

SIR,—To your obituary notice of my old friend, Dr. R. M. Buchanan (THE LANCET, August 29th, p. 509), I should like to add one interesting fact. Some 28 years ago, when the Local Government Board for Scotland was still in existence, and Dr. Russell was still its medical member, a sharp outbreak of enteric fever took place in Glasgow. It was traced to infected shell-fish from a west coast sea loch. This loch was known to be polluted by the sewage of a small town; but this town was a favourite resort of Glasgow trippers at the time of the fair, and, when the tide was down, there was a beautiful expanse of sand, where cockles and mussels were obtainable in marketable quantities. During the fair, there was a considerable amount of acute sickness (due to the shell-fish) at the little town; but the shell-fish sent to Glasgow was accused of originating typhoid fever in the city. I was medical inspector at the time, and Dr. Russell, who was a member of the Royal Commission on Sewage, thought that I might get some light for the Commission on the pollution of shell-fish. I was instructed to visit the place, and to see whether any materials could be found for further investigation.

Cockles were to be had in abundance out of a very grossly polluted area, and I procured, also, some specimens of a siphon-mussel known locally as "mushkin." I believe this was a variety of *Mya arenaria*. I did not verify the point; but the mussel buries itself below the sand, leaving the double siphon open. Several of these I gave to Dr. Buchanan to examine, along with cockles. In his report he gave a series of tests, and claimed to have isolated the *Bacillus typhosus* from one of those mussels. Dr. Russell had assured me that, up to that date, no one had actually found the bacillus in the shell-fish investigated for the Commission. I speak from memory, and, should I overstate, Sir Alexander Houston, who was bacteriologist to the Commission, will put me right. If Dr. Russell's assurance was correct, Dr. Buchanan must have been the first in this country to have demonstrated the presence of the typhoid bacillus in a mussel. So far as I can remember, he had failed to isolate the germ in any of the other shell-fish examined. The text-books tell us that the *Bacillus typhosus* does not survive long in sewage. If it survives at all, the mussels taken from the particular area would be almost sure to show it. I may add that the sewage of the town flowed direct on to the muddy and sandy shore, and included the sewage of a large asylum.

I am, Sir, yours faithfully,
W. LESLIE MACKENZIE.

Edinburgh, Sept. 3rd, 1931.

A REVOLVING SOLARIUM.

To the Editor of THE LANCET.

SIR,—Having recently visited Aix and been taken over the solarium by Dr. Jean Saidman, I was delighted to see Dr. Menko's letter describing it. Dr. Saidman tests every skin by means of a sensinometer and so avoids that erythema dose which is so common. The direct control and accuracy ensures correct dosage and the perpendicular action of the rays ensures penetration. Every patient's history and diagram of sensitisation is in front of the physician in charge. There is no guess work and no arbitrary timing for exposures. On leaving Aix I went to Cannes and Antibes where sun cures are in fashion. There the dosage is measured by how much exposure the bathers can stand lying on the beach and sitting on rocks. One had a vision of oiled backs, sore backs, and brown backs. The whole idea was wrong, but being a fashion, enjoyment was supposed to be obtained that way. I heard of not a few headaches and people who could not lie down in bed after the burning. If they had only known that browning after exposure protects the skin from penetration by the sun's rays, attempts to secure excessive browning in a short time would have gone out of fashion and the bathers have suffered less.

I am, Sir, yours faithfully,
LENNOX WAINWRIGHT.

Upper Wimpole-street, W., Sept. 7th, 1931.

PYREXIAL TREATMENT OF CHOREA.

To the Editor of THE LANCET.

SIR,—The recent work of L. P. Sutton to which you refer in an annotation last week (p. 545) raises a point of great interest. Of the value of heat-therapy in the treatment of chorea there can be no question. It is, however, permissible to criticise the method by which pyrexia is attained in her cases. In the frolic of unstable functions which characterises the choreic state the mechanism of heat-control and the skin take an important share. If the mouth temperature of the choreic child is taken at frequent intervals it will be found to be almost invariably low, while even more than in the healthy child is it disturbed by trivial causes. This thermal inefficiency and instability are associated with irregularity of sweat-secretion, the usual dry skin of the choreic child being prone to profuse and irregular sweating at night occasioned by trivial or hidden causes.

Probably the value of pyrexial treatment is to be ascribed to correction of this physiological failure of heat-control and to a stimulation of the skin and its sweat-glands. Chorea, in common with other rheumatic disorders, can unquestionably be cured by a combination of artificially induced fever and sweating, but some consideration of the child as an individual must guide us in the choice of the method by which these ends are to be attained. Hesitation must always be felt in giving daily intravenous injections to a child; when the child is nervous and choreic the method savours of brutality. A febrile reaction lasting six to seven hours is therapeutically desirable, but the method of its production appears indefensible. Equally good results can be obtained, though not so rapidly, by the daily use of hot packs or a vapour bath which will raise the temperature two or three degrees for one hour, promote free perspiration and induce mental calm and sleep.

This line of treatment has stood the test of experience and although a cure cannot be promised in eight to nine days as is claimed for the method advocated by Sutton, it can be looked forward to with confidence and without the possible harmful effects upon the mentality of an emotional child and the danger of physical harm resulting from the use of a vaccine between which and chorea no possible connexion can be claimed.

I am, Sir, yours faithfully,
CHARLES E. SUNDELL.

Queen Anne-street, W., Sept. 7th, 1931.

CRITERIA OF CURE IN PULMONARY TUBERCULOSIS.

To the Editor of THE LANCET.

SIR,—I think Dr. Struthers is right (p. 530) to call in question the criterion of cure accepted by the Ministry of Health, on the validity of which his cases throw the gravest doubt—a criterion of cure which apparently they do not wish to accept for any figures but their own which show about a 3 per cent recovery-rate for an annual expenditure of about £10,000,000. I have been trying to get accepted as the official criterion of cure a test which has proved itself in cattle to be at the lowest estimate 95 per cent. correct on post-mortem examination, that is the subcutaneous test with a suitable and entirely innocuous dose of a potent tuberculin. A case which after treatment does not give a focal and general reaction may, for all practical purposes, be considered to be cured just as a cow which receives a subcutaneous injection of tuberculin is scientifically considered by every veterinary authority to be free from tuberculosis, that is, free from any lesion with live tubercle bacilli in it. I would therefore alter Dr. Struthers's last sentence to—Call no man cured of tuberculosis until he ceases to give the subcutaneous tuberculin test.

I am, Sir, yours faithfully,
W. M. CROFTON.

University College, Dublin, Sept. 5th, 1931.

BENDIEN'S WORK ON CANCER.

To the Editor of THE LANCET.

SIR,—As grave misconceptions have arisen as the result of the sensational writing up of a few minutes' telephone conversation by one of the Sunday papers, I should be very much obliged if you will let me make it perfectly clear that I have arranged with Dr. Bendien to carry out certain clinical tests of his work in my hospital practice. This work on my part is purely experimental, and I have no intention whatsoever of using it generally or in private cases unless, or until, I am completely satisfied as to its value.

I am, Sir, yours faithfully,
ROY R. KERR, F.R.C.S. Eng.

Manchester, Sept. 5th, 1931.

OBITUARY

NORMAN M. MacLEHOSE, M.B. Glasg.

Mr. Norman MacLehose, who died on August 30th, while on holiday in Ayrshire, was an ophthalmologist of distinction, although his name was never prominently before the medical profession or the public.

Born at Glasgow in January, 1859, Norman Macmillan was the youngest son of James MacLehose, printer and publisher. Educated at a private school, he entered Glasgow University, studying medicine under Sir William Gairdner and Sir Hector Cameron. After qualifying M.B., C.M.Glasg. in 1882 he held resident posts at the Western Infirmary and the Children's Hospital, and entered on general practice at Sevenoaks, before deciding to take up ophthalmology as a career. In 1885 he took the sanitary science certificate, the equivalent of the present D.P.H., at Cambridge, and spent several semesters in the ophthalmic clinics of Berlin and Vienna, returning to settle in London with a clinical assistantship at Moorfields Hospital. Election soon followed to a post on the staff of the Central London Ophthalmic Hospital, from which he retired as full surgeon in 1907. He joined the Ophthalmological Society of the United Kingdom in 1889, serving on its council from 1902 to 1905. At this time the literary bent which he inherited was seen in frequent contributions to the ophthalmic journals and, what was particularly congenial to him, in his work as editor of the *Ophthalmic Review* from 1891 to 1899. All these things were but the background to a private practice which was at one time very large and remained considerable until he retired from professional life in 1928. It has been said of this side of his work, with obvious truth, that no one who had once been in his hands ever willingly consulted another man. Although something of a recluse, he kept himself in touch with modern developments of ophthalmic medicine, and had a first-rate library on his specialty. For the rest he was widely read and keenly interested in many kinds of field sports, especially riding and fishing. When living at Berkhamsted, as he did before the war, he frequently rode to hounds.

Mr. MacLehose's home was in some ways a centre of books and book-lovers, for his wife was the second daughter of the publisher, Alexander Macmillan, and herself a woman of literary talents, for many years crippled by rheumatism. Their younger son fell in the war.

LOUIS SAMBON, M.D. Naples.

We regret to record the death of Dr. Louis Sambon, for many years known in connexion with various fields of research concerned with tropical medicine and the ætiology of malignant disease.

Louis Westenra Sambon was of mixed French and English lineage, his mother being a relation of Charles Dickens. He received his preliminary medical education at St. Bartholomew's Hospital, and he went to the University of Naples, his father, Commendatore Sambon, having Italian relations. There he graduated as M.D., and soon after graduation, in 1884, he was one of the medical officers to whom the dealing with an epidemic of cholera in the country was committed. For this work he received medals from both Italian and French Governments. In 1900, when the researches of Manson and Ross had revealed the history of malaria, Sambon and certain colleagues undertook individual inquiries into the occurrence of malaria in the Roman Campagna, where the disease was historically rife, and from this time forward he became an industrious student of tropical medicine, writing on the subject in many journals and lecturing in the London School of Hygiene and Tropical Medicine. One who had attended these lectures writes: "His popularity was seen in the crowded attendance at these lectures, which were patronised not only by students but by most of the teaching staff as well. Dr. Sambon's sense of humour and poetic methods of description brought forth constant applause from his audience."

Sambon's name is closely associated with long but inconclusive researches into pellagra. He studied the disease in Spain and Italy, and with Prof. Chalmers proved the existence of the disease in this country and Scotland. He wanted to make damaging criticisms of the maize theory of causation in the course of his studies, and substituted a parasitic theory, the parasite being spread by biting flies. With great industry he produced geographical and seasonal arguments in favour of the theory, but no parasite was found in definite association with the disease, while it was seen that a food deficiency theory need not rely upon the intake or otherwise of maize only. His later work was mainly directed to the discovery of the cause of cancer, and he expended much industry in the attempt to prove the parasitic nature of the disease. In support of the theory he made an intensive investigation in Italy, constructing maps intended to illustrate the distribution of cancer in that country. This work led him to conclude that sites of local infection existed, and he became convinced not only that areas of prevalence could be discovered, but that certain houses were the definite foci of infection. This was not a new theory, and statistical evidence was not forthcoming for it, while the connexion between these centres of infection and the presence of the vermin who, according to the theory, were the carriers, could not be established. He obtained, however, considerable support for his views, of the correctness of which he always remained certain.

His death occurred suddenly in Paris on August 31st.

THE LATE MR. PATTISON MUIR.

Many generations of doctors, who have graduated in the University of Cambridge, will join in regretting the death of Pattison Muir, the senior Fellow of Gonville and Caius College, who died on Sept. 2nd at the age of 82.

Matthew Moncrieff Pattison Muir's active connexion with medical education began when, after graduation at the University of Glasgow, he published with Prof. T. E. Thorpe notes on laboratory practice and qualitative analysis. This was in 1879. Then after post-graduate study at Tübingen, he began his long association with Caius College, where there was instituted a series of classes in chemistry designed to meet the needs of those working for the Natural Science Tripos and especially for the medical degree. The classes were not confined to Caius, and Muir attracted immediately a large number of students from all the colleges. He was the most sympathetic of teachers, betraying no impatience in the somewhat thankless task of instilling rudiments, but he was quick to detect those who responded intelligently to his instructions, and became at once their careful and interested guide in more advanced work. A large number of men will remember that they owe to Muir the encouragement which enabled them to make real progress in the science, and will recall his Scottish accents and his wistful manner, never more wistful than when it accompanied his witty sallies. His notes entitled "Chemistry for Medical Students" were used not only at the large medical school at Cambridge but by students of medicine at every university, and although he won his reputation as a scientific writer by more serious work, it is as the author of those notes that he will be most commonly remembered. In 1880 he was made an honorary M.A. of the University of Cambridge, and in the following year was elected a Fellow of Caius, where for more than 30 years he was Prælector in Chemistry. During this time he wrote a treatise on the Principles of Chemistry, which attained to a second edition, and collaborated with Dr. Charles Slater and with Dr. D. J. Carnegie in other text-books on the subject. In 1894 he became, in collaboration with Dr. Forster Morley, responsible for issuing a new edition of Watts's "Dictionary of Chemistry," and this was a valuable literary performance. The Dictionary had passed through many editions since its publication in 1868, requiring supplements which duly appeared, but by 1894 it required not only revision but largely rewriting. The new issue brought the immense subject up to date, while preserving the clear and readable form of the summaries. A second edition was brought out in 1914, and a third in 1927. The historical side of his science always attracted Muir, and he wrote in a fascinating way not only on the vicissitudes of chemical theories and laws, but on the influence of alchemy, these last studies taking shape in a work entitled "Roger Bacon: His Relations to Alchemy and Chemistry."

Pattison Muir retired from his post at Cambridge in 1910, and lived for a time at Norwich where he pursued his researches into the literary aspects of chemistry, and also became interested in the past intellectual activities of the cathedral city. On these subjects he became a much sought for lecturer, and his studies took shape in 1924 in a volume entitled "Men and Women of Letters in Norwich a Hundred Years Ago," which was of far more than local importance. The memory of Pattison Muir will long be preserved at Caius.

ALBERT EDWARD BRINDLEY, M.D.Lond., D.P.H.

Dr. Brindley, whose death occurred on August 21st at West Bridgford, near Nottingham, had but lately retired from the position of medical officer of health for the borough of Derby, which he had occupied for 22 years. Born at Astbury, Cheshire, in 1865, and educated at Congleton and Manchester Grammar Schools, Dr. Brindley entered Owens College, where he gained the Dauntesey medical scholarship, and later became an Associate. He took a science degree at Manchester in 1886, qualified there in medicine three years later, and went on to take the M.D. Lond. Having gained experience as resident at the Royal Infirmary, as a ship's surgeon, in private practice, and as head of a fever hospital, he became, in 1898, medical officer of health for Bury, until appointed to the post at Derby in 1907. Local health services in the town were then admittedly behind the times, and he set himself with characteristic energy to reorganise them almost single-handed. Shrewdness and determination overcame most of the difficulties, the Health Committee acquiescing even when they felt things were going a little fast for them. Maternity and tuberculosis services work were undertaken when still optional on a sanitary authority. Dr. Brindley was especially alive to the housing needs of Derby, and spent much time in solving the problem of crowded dwellings. In so doing he was greatly helped by the cordial relations which always existed between himself and the medical practitioners in the town. Since 1911 he had been lecturer and examiner in public health at the University of Manchester. Apart from his annual and special reports, which were always worth reading, he wrote a number of articles in public health journals on subjects such as housing, hygienic slaughtering of animals, and the control of tuberculosis.

Dr. Brindley was a keen Freemason, at one time a master of the local lodge at Bury; also for many years a member of the Derby Rotary Club. His retirement last April was the occasion of a presentation by members of the health department, who expressed appreciation of his services to the town and good wishes for his retirement. But his health was too far undermined by the stress of office. He leaves a wife, a son, and three daughters.

PARLIAMENT

THE PARLIAMENTARY SESSION.

THE Parliamentary Session opened with a full House on Tuesday last, Sept. 8th, and in an atmosphere which promised a division of main policy that is to be persevered in relentlessly by two parties. The Royal Message, asking that additional taxes should be instituted and economies effected, led to a general debate on the position. The Prime Minister explained that he had found it impossible to bring the late Government into accord with measures which were, he held, necessary to meet an urgent financial emergency, and Mr. Henderson, as leader of the Opposition, replied that he and his followers found the proposed cuts in social services to be unjustifiable. Mr. Baldwin said that the coöperation of the Conservatives in the task of balancing the Budget would be complete. The period for which the Government would function was discussed, and speakers on each side expressed opposite opinions on the cause and extent of the financial emergency, and therefore on the methods of remedy. The majority of the Government, 59, was understood to be a little larger than was anticipated.

MEDICAL NEWS

Research Fellowship in Radiology.

The British Empire Cancer Campaign has received a gift of £25,000 from Sir William Morris for the establishment of a research fellowship in radiology at Mount Vernon Hospital, Northwood. This hospital, which is now devoted to the investigation and treatment of cancer, is in acute financial distress, half of its beds having had to be closed through lack of funds.

Fellowship of Medicine and Post-Graduate Medical Association.

The following courses will take place shortly: medicine, surgery, and specialties at the Metropolitan Hospital, Kingsland-road, E., from Sept. 28th to Oct. 10th; a similar course at the Prince of Wales's Hospital, Tottenham, from Oct. 12th to 24th. Diseases of the throat, nose, and ear Hospital, at the Central London Throat, Nose, and Ear Hospital, Gray's Inn-road, from Oct. 5th to Oct. 31st, and including a clinical course, a pathology class, a peroral endoscopy class, and an operative class; and tropical medicine at the Hospital for Tropical Diseases, 25, Gordon-street, from Oct. 5th to 24th. All these courses occupy the whole of each day. A course of lectures for the M.R.C.P. will be held at 8.30 P.M. at the Medical Society of London, 11, Chandos-street, Cavendish-square, on Mondays and Wednesdays beginning Oct. 5th. Further particulars are obtainable from the Fellowship of Medicine, 1, Wimpole-street, London, W. 1.

Hunterian Society.

The presidential address will be delivered by Dr. David Ross at a dinner meeting, to be held at Simpsons' Restaurant, Cheapside, London, E.C. 2, at 7.15 P.M., on Oct. 22nd. The next dinner meeting will be held at the same place and time on Dec. 17th, when Prof. John Eyre, Dr. W. S. C. Copeman, and Mr. C. R. Rudolf will open a discussion on Oral Sepsis. On Nov. 10th a meeting will be held at the Apothecaries' Hall, E.C., at 9 P.M., when a discussion on the Medical Aspects of Crime in Fact and Fiction will be opened by Dr. Norwood East, Dr. Edwin Smith, and Mr. C. J. S. Thompson.

British Science Guild.

The Alexander Pedler Lecture for 1931 will be delivered at 5.30 P.M. on Oct. 21st, under the joint auspices of the University of Durham Philosophical Society and the British Science Guild, at Armstrong College, Newcastle-on-Tyne, by Prof. Irvine Masson, D.Sc. The title of the lecture will be Problems in the Teaching of Science. The Norman Lockyer Lecture for 1931 will be delivered on Nov. 24th, at 4.30 P.M., in the Goldsmiths' Hall, London, E.C., by Dr. H. H. Dale, F.R.S.

Vacancies

For further information refer to the Advertisement columns.

Aberdeen Royal Infirmary.—Jun. Asst. Surgeon.

Aberdeen Woodend Municipal (General) Hospital.—Jun. Res. M.O. £100.

Accrington, Victoria Hospital.—H.S. £150.

Acton Borough Education Committee, W.—Asst. School M.O. and Asst. M.O.H. £550.

Altrincham General Hospital.—Jun. H.S. At rate of £120.

Ashton-under-Lyne, District Infirmary.—Res. Surg. O. £200.

Bedford County Hospital.—Asst. H.S. At rate of £130.

Birmingham and Midland Eye Hospital, Church-street.—H.S. £110.

Birmingham City Education Committee.—Special Schools M.O. and Director of Child Guidance Clinic, not exceeding £800. Also Two Asst. School M.O.'s Each £500.

Birmingham, Little Bromwich Hospital for Infectious Diseases.—Jun. Asst. M.O. £300.

Birmingham, Monyhull Colony.—Second Asst. M.O. £350.

Birmingham, Selly Oak Hospital.—Cas. O. At rate of £200.

Blackburn County Borough.—Asst. School M.O. and Asst. M.O.H. £700.

Brighton Sanatorium and Infectious Disease Hospital.—Jun. Res. M.O. At rate of £150.

Bristol Royal Infirmry.—H.P. Also Asst. H.S. Each at rate of £60.

Burnley County Borough.—Asst. M.O.H. and Asst. School M.O. £500.

Chester, Wrenbury Hall Tuberculosis Training Colony.—H.P. £250.

City of London Maternity Hospital, City-road, E.C.—Asst. Res. M.O. At rate of £80.

Connaught Hospital, Walthamstow, E.—Sen. Res. H.S. At rate of £150.

Derby County Mental Hospital, Mickleover.—Res. Jun. Asst. M.O. £350.

Derby, Derbyshire Hospital for Women, Friar Gate.—H.S. At rate of £150.

Dudley Guest Hospital.—H.S. £170–£200.

East Ham Memorial Hospital, Shrewsbury-road, E.—H.P. At rate of £150. Also H.S. to Special Depts. and Cas. O. Each at rate of £120.

Great Yarmouth General Hospital.—H.S. £140.

Guildford, Royal Surrey County Hospital.—H.S. £150.

Hammersmith Hospital, Ducane-road, W.—Asst. M.O. £350.

Hastings, Royal East Sussex Hospital.—Sen. H.S. At rate of £150.

Hereford County and City Mental Hospital.—Med. Supt. £600.

Hertford, Watford Maternity and Nursing Home.—Visiting M.O. £120.

Hospital for Sick Children, Great Ormond-street, W.C.—H.S. and H.P. Each at rate of £100.

Hull Royal Infirmary.—Hon. Asst. Physician.

Ilford, King George Hospital.—H.S. At rate of £100.

Kidderminster and District General Hospital.—H.S. £150.

King's College Hospital, Denmark Hill, S.E.—Hon. Anæsthetist.

Lingfield, Surrey, Epileptic Colony.—Asst. M.O. £275.

Liverpool Eye and Ear Infirmary, Myrtle-street.—H.S. to Ophth. Dept. £120.

Liverpool Royal Southern Hospital.—H.P., M.O. to Spec. Depts., and Res. Anæsthetist. All at rate of £60.

Liverpool, St. Paul's Eye Hospital, Old Hall-street.—H.S. At rate of £120.

London Female Lock Hospital, Harrow-road, W.—H.S. At rate of £150.

Longton Hospital, Staffs.—H.S. £150.

Macclesfield General Infirmary.—Sen. and Jun. Res. M.O.'s. At rate of £180 and £150 respectively.

Manchester, Ancoats Hospital.—Res. Surg. O. £200.

Manchester Royal Eye Hospital.—Jun. H.S. £120.

Manchester, Royal Infirmary.—Jun. Asst. M.O. for Radiological Dept. £400.

Margate Royal Sea Bathing Hospital for Surgical Tuberculosis.—H.S. At rate of £200.

Miller General Hospital, Greenwich-road, S.E.—Hon. Gynæcologist. Also Cas. O. and H.P. At rate of £150 and £125 respectively.

National Hospital, Queen-square, W.C.—Asst. Registrar. £200.

Newcastle-upon-Tyne, Royal Victoria Infirmary.—Hon. Physician to Skin Dept.

Norwich, Norfolk and Norwich Hospital.—H.S. £120.

Portsmouth, Royal Portsmouth Hospital.—Cas. O. At rate of £100.

Princess Beatrice Hospital, 194, Finborough-road, S.W.—R.M.O.

Putney Hospital, Lower Common, Putney, S.W.—Res. M.O. At rate of £150.

Queen's Hospital for Children, Hackney-road, E.—H.P. At rate of £100.

Reading, Royal Berkshire Hospital.—Radiological H.S. and Res. Anæsthetist. At rate of £150.

Richmond, Surrey, Royal Hospital.—Hon. Surg. to Ear, Nose, and Throat Dept.

Rochdale Infirmary and Dispensary.—Jun. H.S. £200.

Royal Eye Hospital, St. George's Circus, S.E.—Twelve salaried Refractionists, twelve Clin. Assts., and Pathologist.

Royal National Orthopædic Hospital, 234, Great Portland-street, W.—Two H.S.'s Each at rate of £150. Also H.S. for County Branch, Brockley Hill, Stanmore. At rate of £150.

Royal Waterloo Hospital for Children and Women, Waterloo-road, S.E.—Cas. O. At rate of £200. Also H.S. At rate of £100.

St. Giles Hospital, Brunswick-square, Camberwell, S.E.—Part-time Radiologist. At rate of £236 5s.

St. Mary's Hospital, W.—2nd Asst. Pathologist. £250. Also Obstetric Registrar. £50.

St. Thomas's Hospital, S.E.—Res. Asst. Surgeon. Also Surg. Reg.

Salford Royal Hospital.—Res. H.S.'s. to Special Depts. Also Cas. H.S. All at rate of £125.

Scarborough Hospital and Dispensary.—Two H.S.'s. Each at rate of £175.

Scotland, Department of Health.—M.O. £600.

Sheffield, Jessop Hospital for Women.—Sen. Res. M.O. £200. Also Res. M.O. and two Asst. H.S.'s. At rate of £150 and £100 respectively.

Sheffield Royal Hospital.—Ophth. H.S. Also Anæsthetist. £120 and £80 respectively.

Sheffield Royal Infirmary.—Asst. Aural and Ophth. H.S. and H.S. and Second Asst. Cas. O. Each at rate of £80.

Southampton County Borough.—Asst. M.O.H. £500.

Stafford, Staffordshire C.C. County Bacteriological Laboratory.—Asst. Bacteriologist and Pathologist. £700.

Stamford, Stamford, Rutland and General Infirmary.—H.S. At rate of £150.

Sutton and Cheam Hospital.—Res. M.O. At rate of £150.

Swansea, Infectious Diseases Hospital.—Res. M.O. £350.

Taunton, Taunton and Somerset Hospital.—Asst. H.S. At rate of £100.

Watford, Herts., Peace Memorial Hospital.—Res. and Surg. M.O.'s. Each at rate of £150.

Wells, Somerset, Mental Hospital.—Asst. M.O. £350.

West London Hospital, Hammersmith-road, W.—H.P., H.S.'s, and Res. Anæsthetist. All at rate of £100.

West Riding of Yorkshire County Council.—Temp. Sch. Med. Inspectors. £500.

Windsor, King Edward VII. Hospital.—H.S. At rate of £100.

Woolwich and District War Memorial Hospital, Shooters Hill, S.E. Res. M.O. £175.

The Chief Inspector of Factories announces vacant appointments for Certifying Factory Surgeons at Milnthorpe (Westmorland), at Ulceby (Lincoln), and at Holt (Norfolk).

Births, Marriages, and Deaths

MARRIAGES.

Higgins—Hodgkinson.—On Sept. 3rd, at St. Philip's Church, Alderley Edge, James Basil Higgins, M.B., Ch.B. Vict., D.M.R.E. Camb., to Muriel Betty Hodgkinson, daughter of Mr. and Mrs. E. Nicholls Hodgkinson, of Wilmslow.

Satchwell—Jones.—On Sept. 1st, at Llanfyllin, Montgomeryshire, Hubert John Satchwell, M.B., Ch.B. Bristol, of North Curry, Somerset, to Mary Glennie Jones, M.B. Ch.B. Liverp., of Llanfyllin.

Tylor—Bazett.—On Sept. 3rd, at Totnes, Devon, Max F. Tylor, M.B., B.Ch. Oxf., of Dartmouth, to Christine Margaret Bazett, second daugher of Mr. Charles Bazett and the late Mrs. Bazett, of Victoria, British Columbia.

Walker—McCormick.—On Sept. 5th, at Holy Trinity Church, Brompton, Robert Milnes Walker, M.S. Lond., F.R.C.S. Eng., of Wolverhampton, to Grace Anna, eldest daughter of Dr. and Mrs. McCormick, of London.

DEATHS.

Barbour.—On August 31st, at Portsea-place, Hyde Park, W., James Barbour, M.D. Edin., in his 83rd year.

Blurton.—On Sept. 6th, suddenly, at West Bridgford, Nottingham, Gilbert Blurton, M.B., B.S. Lond., aged 39.

Harwood.—On August 31st, suddenly, in London, Thomas Eustace Harwood, M.B., Ch.B. Edin., aged 56.

Parr-Dudley.—On August 31st, at the Hospital, Maidstone, A. Dudley Parr-Dudley, Barrister-at-Law, M.R.C.S., L.R.C.P. Lond., of East Malling, Kent, formerly of Cossington, Leicestershire, aged 72.

Richards.—On Sept. 4th, Ramsey Martyn Richards, M.R.C.S. Eng., L.R.C.P. Lond., Surgeon Captain R.N., retired, of Betworth, Exmouth, aged 56.

Sambon.—On August 31st, suddenly, in Paris, Prof. Louis W Sambon, M.D. Naples, of Fordwych-road, London.

White.—On Sept. 3rd, at Weston-super-Mare, and late of Cambridge, Sidney Hugh White, M.R.C.S. Eng., L.R.C.P. Lond., Surgeon Captain R.A.M.C., aged 58.

Whitehead.—On Sept. 1st, at the London Hospital, Henry Edward Whitehead, M.R.C.S. Eng., L.R.C.P. Lond., of Caledonian-road, N., aged 69.

N.B.—A fee of 7s. 6d. is charged for the insertion of Notices of Births, Marriages and Deaths.

NOTES, COMMENTS, AND ABSTRACTS

BRITISH WATERWORKS.

We have received from the British Waterworks Association a copy of their Yearbook and Directory for 1930–31. This is the third edition of a reference book of great usefulness, edited by Mr. G. P. Warner Terry, barrister-at-law, which may be had for one guinea, post free, from the Secretary of the Association, 173, Rosebery-avenue, London, E.C. 1. The major part of the book consists of an alphabetical directory of waterworks throughout England and Wales, embodying replies to a questionaire, and containing information under headings such as Date of Establishment, Special Acts, Limits of Supply, Character of Water, Source of Supply, Service Reservoirs, Domestic Charges, and so forth. Following this is a series of statistical tables, also compiled from actual returns received. Table 4, which is of special interest, gives the average supply of water per day per head of population in the area, which varies from 10 gallons for West Mersea, and 11 gallons for Cardiff rural, up to 95 for Irvine, 108 for Burntisland, and 180 for Greenock, most of the large municipalities providing 25–35 gallons a head. The time is not far distant when water authorities may have to combine to consider, in the interests of municipal economy, what is the minimum amount of water which covers the whole demands of health and reasonable comfort. Since an inch of rainfall on an acre of land yields more than 22,000 gallons of water, it might be thought that some of these figures are stingy, but only a small proportion of this rainfall can ever reach the waterworks pumps, and it is not long ago that a general water shortage was feared. The twelfth annual report of the Ministry of Health admits that much remains to be done before the water supply in rural areas can be regarded as satisfactory, and alludes to the need of gauging rivers and underground waters.

ROYAL INSTITUTE OF PUBLIC HEALTH.

In addition to the places mentioned on page 495 of the Students' Guide (The Lancet, August 29th), courses of study for public health degrees and diplomas are offered in London by the Royal Institute of Public Health. The syllabus is covered by a teaching staff of nine under the headings Chemistry and Physics, Hygiene *Physiology and Physiotherapy*, Applied Bacteriology and Immunology, General Principles of Public Health, Epidemiology and Vital Statistics, Sanitary Law and Administration, Public Health Administration, Sanitary Construction and Planning, Port Sanitary Administration, Meat and Food Inspection. The course includes the practical work of a medical officer of health, visits to places of public health interest, and instruction in the selection of building sites, heating, lighting and ventilation of occupied premises, and so forth. There is a composition fee for the whole course, which can be commenced at any time. Particulars from the secretary at 37, Russell-square, London, W.C. 1.

THE BEAD TEST OF GASTRO-INTESTINAL FUNCTION.

Under the auspices of the French Government a group of American doctors recently visited the principal thermal and climatic resorts of France. The visitors included Dr. Max Einhorn, who gave a lecture at Vichy on the Bead Test (digestive test capsules). He explained that the method consisted in causing the patient to swallow a little capsule containing beads attached to a thread, each bead being covered with different types of food, to test the activity of the digestive process in the different parts of the intestinal tract. The food substances employed are catgut, fishbone—to test gastric digestive function—and meat, thymus, mutton fat, potato (with the peel)—to test intestinal digestive function. The capsule is swallowed after a meal, and the beads are evacuated per rectum, after a period which may indicate some degree of stasis or too rapid passage of foodstuffs through the intestinal canal. The beads are then gently washed in cold water, and examined, in order to ascertain the degree of digestion undergone by each of the nutritive substances which covered them. Dr. Einhorn said that the test had enabled him to classify gastro-intestinal dyspepsia into three categories: partial, total, and nervous dyspepsia, the latter being purely functional.

WALKING ON THE MOORS.

Mr. W. Ridley-Makepeace has followed up his little book on Goathland Walks by a further series of Walks and Talks on the North Yorkshire Coast and Moors. (London: A. Brown and Sons, Limited, 5, Farringdon-avenue, E.C. 4. Pp. 120. Price 1s.) He is a rambler of sixty years' standing, who desires to attract the north, south, and west to a part of England which he regards as the pedestrians' paradise. He describes and illustrates a series of eleven walks, with a wealth of interesting detail, historical and topographical. As a whole-hearted walker, he also devotes space to the dangers of motor-vehicle traffic, and to the slovenly and dirty habits of picnickers who leave their litter behind, quoting with approval Mr. F. A. Rush's lines which begin—"Why dost ta' throw thi rubbish here, Tha mucky lout?" and, with some change of vernacular, might be posted on every spot of open ground in the country. The booklet is made more valuable by a complete index.

COINING NEW WORDS.

To the Editor of The Lancet.

Sir,—New words are always being coined, and anybody may do so by design, native wit, or mere accident. The *Times* some time ago accidentally invented the word "carbarian" for barbarian. A policeman at Stratford police-court this week called a pillion rider on a bicycle (a female, but either sex could have been meant) a "pillionaire." Last week I read in a Paris journal of a Russian who had lost his right leg, and was described as "l'unijambiste." This word is new to me, and not in my up-to-date "Nouveau Petit Larousse," although "manchot" (estropié ou privé d'une main ou d'un bras) as applied to one-handed or one-armed is there. For "unijambiste" I suggest in English "one-legger."

I am, Sir, yours faithfully,

Sept. 5th, 1931. Blancus.

Medical Diary

Information to be included in this column should reach us in proper form on Tuesday, and cannot appear if it reaches us later than the first post on Wednesday morning.

LECTURES, ADDRESSES, DEMONSTRATIONS, &c.

FELLOWSHIP OF MEDICINE AND POST-GRADUATE MEDICAL ASSOCIATION, 1, Wimpole-street, London, W.

Monday, Sept. 14th to Saturday, Sept. 19th.—Infants Hospital, Vincent-square, S.W. Post-graduate Course in Diseases of Infants. Every afternoon at 2 P.M.—Central London Ophthalmic Hospital, Judd-street, W.C. Course in Ophthalmology. Every afternoon. Demonstrations and lectures, and hospital practice. Fee £3 3s.—Westminster Hospital, S.W. Post-graduate Course in Medicine and Surgery and the Specialties. Men only. 10.30 A.M. to 5.30 P.M. daily. —Further particulars from the Fellowship of Medicine.

CENTRAL LONDON THROAT, NOSE, AND EAR HOSPITAL, Gray's Inn-road, London, W.C.

Friday, Sept. 18th.—4 P.M., Mr. A. Lowndes Yates: Incipient Deafness.

ST. MARK'S HOSPITAL, City-road, E.C.

Thursday, Sept. 17th.—4.30 P.M., Dr. Browning Alexander: Visceroptosis.

ADDRESSES AND ORIGINAL ARTICLES

PRECANCEROUS LESIONS OF THE ALIMENTARY TRACT.*

BY MATTHEW J. STEWART, M.B. GLASG., F.R.C.P. LOND.,
PROFESSOR OF PATHOLOGY IN THE UNIVERSITY OF LEEDS.

LECTURE II.

Cholelithiasis and Cholecystitis.

THAT there is an intimate association between gall-stones and carcinoma of the biliary passages, especially the gall-bladder, has long been recognised, but much difference of opinion still exists as to the exact relation of cause and effect.

In a series of 43 cases of carcinoma of the gall-bladder seen in the post-mortem room at Leeds, there were 30 with gall-stones, 69·8 per cent., as compared with 16·4 per cent. in the control series (1031 gall-stone cases in 6284 autopsies †). The difference (53·4 ± 7·0 per cent.) is highly significant. Various authors record similar and even higher rates (69 to 100 per cent., Rolleston and McNee, 1929). In the Leeds series there were also 20 cases of carcinoma of the larger (extra-hepatic) bile-ducts, including 11 with cholelithiasis, 55 per cent. The difference between this figure and the control (38·6 ± 11·1 per cent.) is less striking, but still significant. In the statistics of other authors gall-stones have usually been present in about one-third of the cases (Rolleston and McNee).

The closeness of association of the two diseases is equally well brought out when the problem is approached from the opposite standpoint. In the Leeds series the incidence of carcinoma of the biliary tract in cases of cholelithiasis was 3·8 per cent. as compared with 0·4 per cent. in the controls, a difference (3·4 ± 0·59 per cent.) which is highly significant. Other authors give even higher figures for the malignant cases (4 to 14 per cent.).

Of the principal varieties of biliary calculi, multiple facetted, solitary cholesterol, mulberry and pigment stones, it is apparently the first which is most frequently encountered in association with local cancer. Unfortunately it has been found possible to classify with exactness barely one half our total cases of cholelithiasis (Table IX.).

TABLE IX.—*Relative Frequency of Multiple Facetted and Solitary Cholesterol Gall-stones in Cancer of the Biliary Tract.*

Types of stones.	6284 control cases (over 40).	63 cases of cancer of biliary tract.	Percentage difference.	Standard error of difference.	Statistical significance.
	With gall-stones.				
Multiple facetted .	202 (3·2 %)	15 (23·8 %)	20·6	5·37	+
Solitary cholesterol	176 (2·8 %)	3 (4·8 %)	2·0	2·10	–

This shows clearly that the association is with multiple facetted calculi. Solitary cholesterol stones do not occur with significantly greater frequency in cases of biliary tract cancer than in the controls. Now, it is well known that it is the multiple facetted and pigment calculi which are chiefly encountered in cases of cholecystitis, and there are good grounds for the belief that the inflammatory lesion antedates, and is causally related to, the other. The solitary cholesterol and mulberry stones are of metabolic origin, and, as Gross (1929) has clearly shown, are unassociated with definite inflammatory lesions of the gall-bladder. The most probable sequence of events would therefore appear to be cholecystitis, cholelithiasis, carcinoma. The gall-stones may well act in a dual capacity, on the one hand maintaining and increasing the inflammatory reaction, on the other exerting a directly carcinogenic effect, mechanical or chemical, on the surviving epithelium.

Experimental evidence that gall-stones are capable of inducing carcinoma of the gall-bladder has been provided by Leitch (1924), who inserted into the gall-bladder of a series of guinea-pigs human gall-stones, pebbles, and pilules of pitch and lanoline. In eight (five with gall-stones, two with pebbles, and one with pitch) an apparent adenocarcinoma developed after 5½ to 12 months. The tumours had not undergone metastasis, and were not flagrantly malignant of aspect, but they were definitely infiltrative, and had invaded the liver, diaphragm, and abdominal muscles. Leitch himself was satisfied as to their carcinomatous nature. In two of the positive animals sterile pebbles had been used, and Leitch was of opinion that the causative factor was physical trauma rather than chemical irritation.

Gastric Ulcer.

This continues to be a topic of perennial interest to physician and surgeon, pathologist and radiologist alike, and it cannot be said that we have yet got to the root of the problem. What are the chances of a chronic gastric ulcer becoming malignant? How may this transformation be detected at the earliest possible moment? How may a surgeon at the time of operation know whether a cratered lesion of the stomach is simple or malignant? By what histological criteria may the pathologist distinguish between a simple ulcer, an ulcerative cancer, and a *carcinoma ex ulcere*? These are some of the practical issues on which further illumination is required.

INDEPENDENT COEXISTENCE OF ULCER AND CANCER.

It is a rare event for a simple chronic ulcer and a carcinoma to occur independently in the same stomach. In a series of 366 operation specimens examined between Jan. 1st, 1921, and June 1st, 1931, there were but three instances, and in a still larger series from the post-mortem room the incidence was even less. In only one case, seen at autopsy, were the two lesions situated side by side. Their independence of each other was manifest, since they had obviously come together in consequence of the centrifugal spread of the carcinoma. The ulcer, a typical chronic lesion, was situated almost exactly on the middle of the lesser curvature, and had given rise to a moderate grade of organic hour-glass contraction. The new growth, an equally typical ulcerated carcinoma, was situated saddle-wise across the lesser curvature, and extended from the upper margin of the ulcer to the cardia. In the other instances the cancer occupied its more usual position at or near the pylorus, the ulcer being situated one or two inches higher up.

MORBID ANATOMY AND HISTOLOGY.

There are certain points in the structure and evolution of a chronic ulcer and of a primary carcinoma of the stomach which must be kept clearly in mind when considering the question of ulcer-cancer.

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* The Croonian Lectures delivered before the Royal College of Physicians of London on June 4th, 9th, and 11th, 1931. Lecture I. appeared last week.

† Only cases 40 years of age and over are included.

(1) The great majority of chronic ulcers which have existed for any length of time (months or years) have completely breached the muscular coat over an area at least as large as the widest part of the crater itself. This gap is occupied, though at a lower level, by a typical mass of dense sclerotic tissue, covered on its interior aspect by a narrow zone of fibrinoid necrosis and a quantity of purulent exudate and necrotic debris. The muscular coat either terminates abruptly in the lateral walls of the crater, or turns upwards into the floor when contraction is taking place therein. In healing ulcers, or at any point in the margin where partial healing has occurred, the muscular coat and the muscularis mucosæ tend to blend with one another in a very characteristic fashion.

(2) When a chronic ulcer has healed, there is usually remarkably good regeneration of the mucous coat, together with some slight regeneration of the muscularis mucosæ. The most notable permanent changes are in the muscular coat, which is not regenerated. There is complete and permanent replacement of a considerable area of muscularis, the extent of which depends on the size and chronicity of the original ulcer, by dense collagenous scar tissue. At first the scarred area is broad and cellular, but with the passage of months and years it becomes excessively sclerotic, almost acellular, and comes to contain masses of elastic tissue which cause it to be yellow instead of white. In many scars a certain amount of epithelial displacement, so-called deep regenerative heteroptopia, is encountered, by which simple, newly formed glands grow downwards into the surface layers of scar tissue and into or even through the muscularis mucosæ at the margins. It is a benign, self-limiting process, and there is no evidence that it is a precursor of malignant disease.

(3) When a carcinoma arises in a chronic ulcer it does so in the margin, probably at one point only. As the tumour increases in size it tends to encircle the ulcer rather than to penetrate the sclerotic floor, while also growing outwards from it. Ultimately the crater becomes completely surrounded by growth, while the floor itself may be partially invaded.

Much of the difficulty in the pathological diagnosis of ulcer-cancer arises in cases of this kind. Where there is only a small focus of malignancy on one side of a chronic ulcer there can be no doubt as to the sequence of events. When a cratered lesion shows a typical central ulcer floor devoid of cancer cells, with a complete ring of carcinomatous tissue encircling it, the question is, can such a lesion be brought about by secondary peptic ulceration of a primary carcinoma? If the whole floor of the crater is covered by growth, it is necessary to know whether such an appearance can result from the cancerisation of an ulcer.

(4) Primary carcinoma, even when it has infiltrated the whole thickness of the stomach wall, tends to conservation of the muscular coat, in many cases of the muscularis mucosæ as well (Dible, 1924–25; Stewart, 1926, 1928, 1929). These structures are, in fact, often much hypertrophied, standing out prominently on section, and even in that very fibrous lesion, the leather-bottle stomach, bundles of unstriped muscle persist in the midst of the fibro-neoplastic tissue. When secondary peptic ulceration is superimposed, however, neoplastic and non-neoplastic tissue alike gives way before it, and a more or less deeply cratered lesion results. If in the floor of such an ulcer persisting bundles of unstriped muscle, however scanty, can be detected amongst the tumour tissue assuredly the lesion is primarily carcinomatous. If a continuous zone of carcinomatous tissue across the floor of the ulcer is supported by dense scar tissue devoid of muscle-fibres, it is practically impossible on anatomical grounds to come to a definite decision.

Other facts in the case must be taken into account, the exact site of the lesion, the results of previous gastric analysis, and, in particular, the clinical history. Just as difficult are the cases in which scattered carcinomatous foci are present throughout an otherwise typically ulcerous floor, or when only a small area of cancer-cell-free sclerosis is present in the midst of the carcinomatous tissue. Unless there is definite clinical support for a diagnosis of ulcer-cancer it is my practice not to include such cases in this group. I certainly think it is possible for carcinomatous tissue to grow inwards over the floor of a simple ulcer, replacing the inner more cellular layer of granulation tissue. It is much more difficult for the neoplasm to replace or even to permeate the densely sclerotic deeper layers. I have recently encountered a case in which a carcinoma of the greater curvature had extended round the walls of the stomach until its margins met on the lesser curvature just below the site of a previously existing scar, and it was interesting to notice how considerable a barrier this had interposed to the further upward extension of the growth at this point. Only a few islets of epithelial tissue, though these of some size, had succeeded in penetrating the sclerotic mass. No conclusive evidence is available, on the other hand, that peptic ulceration of a primary carcinoma is capable of producing a zone of cancer-cell-free fibrosis in the floor. Assuredly this process may lead to an extensive breach of the muscularis, and, as Newcomb (1930) has pointed out, the same is true, *mutatis mutandis*, for some ulcerated carcinomas of the large intestine. In 100 intestinal cancers examined by him, six showed absence of muscle in the base of the lesion, and four of these exhibited marked fibrosis as well. Dr. Newcomb has been good enough to show me some of these sections, and in none of them is there an area of *cancer-cell-free* fibrosis such as one finds in ulcer-cancer of the stomach. This is the salient point of my criteria, and I do not think that Newcomb's analogy in any way detracts from its value. There can be no doubt of the great importance of Turnbull and Newcomb's (1925) criterion of fusion of muscularis mucosæ and muscularis as evidence of pre-existing ulcer. My contention, however, is that if this sign is always insisted on a number of real ulcer-cancers will be wrongly classified as ulcerated carcinomas. Fusion of these layers is evidence of healing, and carcinoma can undoubtedly arise in ulcers where no indication of healing exists.

One other possibility must be mentioned, that peptic ulceration commencing in a carcinoma may spread thence to the adjacent healthy wall. In my series there are four such cases, but in none had the ulcerative process involved the muscular coat to any serious extent. Clinically, such cases would resemble primary carcinoma rather than ulcer-cancer.

TABLE X.—*Position of Chronic Ulcer, Ulcer-cancer, and Primary Cancer in a Series of 358 Operation Specimens.*

Site of lesion.	Chronic ulcer.	Ulcer-cancer.	Primary cancer.
Pyloric canal ..	15 (5·7 %)	5 (29 %)	71 (84·5 %)
Lesser curvature region	248 (94·3 %)	12 (71 %)	9 (10·7 %)
Rest of stomach ..	—	—	4 (4·8 %)
Total *lesions*, 364*	263	17†	84

* In three cases two chronic ulcers coexisted, and in three others there were independent ulcers and cancers.

† Four of these cases in which death followed partial gastrectomy are also included in Table XI.

SITE OF THE LESION.

The vast majority of chronic gastric ulcers, fully 80 per cent., are situated in the lesser curvature region, most of the remainder being at or near the pylorus. Carcinoma, on the other hand, commences in the pyloric region in about two-thirds of the cases. The site of ulcer-cancer, as one would expect, approximates to that of simple ulcer (Table X.).

It may be objected that this gives only a partial and inaccurate view of the position, since it omits all inoperable cases. This objection applies with any force only to cases of carcinoma, and much less forcibly to ulcer-cancer. Table XI. has therefore been compiled from autopsy material to give a truer picture.

TABLE XI.—*Position of Primary Carcinoma and of Ulcer-cancer of the Stomach in a Series of 279 Post-mortem Specimens.*

—	Primary carcinoma.	Ulcer-cancer.
Pyloric canal	145 (61·1%)*	10 (31%)
Lesser curvature region	18 (8·0%)	22 (69%)
Cardiac region	37 (16·4%)	—
Rest of organ	26 (11·5%)	—
Totals	226	32†
Whole organ (more or less) ..	21	—
	247	—

* Twenty-one cases in which the whole or almost the whole organ was involved are not included in estimating the percentage incidence.

† Four of these cases in which death resulted from partial gastrectomy are also included in the list of 17 ulcer-cancers shown in Table X.

The topographical distribution of ulcer-cancer here shown, approximating as it does much more closely to that of ulcer than to that of cancer, would seem to indicate that the criteria used in the diagnosis of ulcer-cancer are reasonably near the truth. Tables XII. and XIII. focus attention on the comparative frequency with which carcinoma arises in pre-existing ulcer in the two main sites.

TABLE XII.—*Position of Chronic Gastric Ulcer in Relation to the Subsequent Development of Ulcer-cancer. (277* Clinical Specimens.)*

—	Ulcers.	With cancer arising in them.	Incidence of cancer.
Pyloric canal	20	5	25·0%
Lesser curvature ..	260	12	4·6%
Total	280*	17	—

* In three cases two chronic ulcers coexisted.

TABLE XIII.—*Position of Gastric Carcinoma in Relation to Pre-existing Simple Ulcer. (101 Clinical Specimens.)*

—	Carcinomas.	Arising in ulcer.	Incidence.
Pyloric canal	76	5	6·6%
Lesser curvature region	21	12	57·1%
Rest of stomach ..	4	0	—

Orator (1925), whose figure for the incidence of cancer in ulcer is very similar to my own (5·1 per cent., as compared with 6·1 per cent.), gets fairly comparable figures to those shown in Table XII. (11 cases of cancer arising in 34 ulcers of the pyloric canal—33·2 per cent.; 6 cases in 300 lesser curve ulcers—2·0 per cent.).

The conclusions to be drawn from these figures—i.e., in partial gastrectomy material only—are (1) that out of every three carcinomas arising in the lesser curvature region one inch or more from the pylorus approximately two have had their origin in a pre-existing simple ulcer, and (2) that whereas only one lesser curve ulcer in 20 shows evidence of malignant transformation, one in every four of those situated in the pyloric canal shows this change. What is the explanation of this difference? Hurst (1929*a*) suggests with much cogency that the additional factor is friction. He points out that neither the fundus of the stomach (where cancer is extremely rare) nor the duodenal bulb (where it is unknown) is ever subjected to friction. It is only in the pyloric vestibule that definite churning movements occur. Friction, minimal in the body of the stomach, steadily increases in intensity as the pylorus is approached, owing to the increasing depth of the peristaltic waves. It is probably for this reason that primary ulcer in the pyloric canal, though of comparatively infrequent occurrence, is particularly liable to malignant transformation.

PERFORATION.

In primary carcinoma of the stomach, perforation, whether acute or subacute, is a comparatively rare event. It had occurred in 15 of 276 cases in my autopsy series (5·4 per cent.). Simple chronic ulcer, on the other hand, shows a high perforation rate, 85 out of 242 cases (35 per cent.). The figures for ulcer-cancer approximate closely to those of simple ulcer, 9 out of 28 cases (32 per cent.). Those who refuse to accept these as genuine examples of *carcinoma ex ulcere* may reasonably claim that they represent merely a special group of primary cancers in which secondary peptic ulceration is unusually far advanced. I prefer to regard these figures as further confirmation of the truth of my ulcer-cancer criteria.

GASTRIC ANALYSIS.

The typical case of primary carcinoma with a short history shows either achlorhydria or hypochlorhydria when investigated by the fractional test-meal method. Complete achlorhydria was present in 65 per cent. of 74 cases investigated by Hurst (1929*a*), and other authors give comparable figures. There is naturally much less available evidence in connexion with ulcer-cancer. In my series fractional test-meals had been carried out in only nine cases, but the results are striking. No fewer than six had a high normal or hyperchlorhydric curve. In Table XIV. the results are compared with those obtained in 54 cases of simple ulcer and 30 cases of primary carcinoma. In each a partial gastrectomy had been performed and the specimen submitted to careful microscopic examination.

TABLE XIV.—*Fractional Test-meal Results in a Series of Pathologically Verified Cases of Ulcer, Ulcer-cancer, and Cancer of the Stomach.*

—	Simple chronic ulcer (54 cases).			Ulcer-cancer (9 cases).			Primary cancer (30 cases).		
Achlorhydria ..	20%	3 (6%)		13%	0		80%	22(73%)	
Hypochlorhydria		7	94%		1	100%		2	27%
Normal		35			5			6	
Hyperchlorhydria		9			3			0	

These figures are few, but they suggest that in contradistinction to primary carcinoma a normal or hyperchlorhydric curve is the rule in ulcer-cancer as in ulcer. They may reasonably be regarded as affording further confirmation of the criteria of ulcer-cancer set forth above. There is, of course, an alternative hypothesis—that a certain small proportion of primary carcinomas arise in stomachs which still possess a normal or hypernormal secretion of free hydrochloric acid. Such carcinomas would be more likely than those associated with achlorhydria to undergo secondary peptic ulceration, with on the one hand an increased tendency to perforation, and on the other a liability to assume in time the characters here regarded as typical of ulcer-cancer.

CLINICAL HISTORY.

Most writers on this subject have emphasised the importance of the clinical history in confirming or otherwise the conclusions arrived at on anatomical grounds (Dible 1924–25). The discovery that a lesion, regarded on pathological ground as ulcer-cancer, has given rise to symptoms for a few months only, is liable to shake one's faith in the reliability of one's histological criteria. In my series only one such case occurs, and it must be remembered that chronic ulcers do occasionally form and persist with little or no clinical evidence of their presence. Table XV. presents an analysis of my clinical material to date.

TABLE XV.—*Duration of Symptoms at the Time of Operation in* (A) *Simple Chronic Ulcer,* (B) *Primary Carcinoma, and* (C) *Ulcer-cancer of the Stomach.*

Duration of symptoms.	Simple ulcer (218 cases).	Primary cancer (69 cases).	Ulcer-cancer (17 cases).
0–6 months	9 } 10 %	31 } 73 %	1 } 6 %
6 months–1 year ..	14	19	0
1–2 years	17	7	1
Over 2 years	178 (82 %)	12 (17 %)	15 (88 %)
„ 5 „	136 (62 %)	0	11 (65 %)
Average duration of symptoms	8 years	11 months	5¼ years

These figures I submit are strong evidence in support of the accuracy of one's anatomical criteria.

Hurst (1929*b*) and others have emphasised the fact that when a simple ulcer undergoes malignant degeneration there is not infrequently a definite change in the symptomatology. The pain becomes more severe and more persistent, it ceases to observe its former time-relation to the taking of food, coming on, as a rule, immediately after meals instead of after a constant interval, and remissions either do not occur or are much less complete than before. Hurst also stresses the importance of the persistence of occult blood in the stools in spite of the most rigid dietetic and medicinal treatment, and the fact that radiologically the ulcer-crater, while it may get smaller, never completely disappears, as it does in most cases of chronic ulcer when properly treated. I would add a further point. The presence of altered blood in all or most of the fractions of the Rehfuss test-meal is strongly suggestive of malignancy, and if encountered in a case with a long ulcer-history the possibility of malignant degeneration must at once be raised. In the nine ulcer-cancer cases in my series in which a fractional test-meal was done, blood was present in seven. This contrasts with the findings in simple chronic ulcer, where altered blood is rarely encountered in routine test-meal examinations.

FREQUENCY OF ULCER-CANCER.

It is impossible to say with any degree of certainty what proportion of chronic ulcers become malignant, but the number is probably small. Most chronic ulcers will heal if given a chance, and with the restoration of continuity of the stomach wall the chances of malignant metamorphosis become greatly reduced. The incidence of carcinoma in ulcers which have been removed surgically is not inconsiderable, in my series 17 in 277, or 6·1 per cent. It is clear from the frequency with which well-healed scars are encountered in the stomach that the actual proportion of chronic ulcers which become malignant must be much less than this. The importance of chronic ulcer as a precancerous condition is, however, more strikingly brought out by regarding the problem from the cancer point of view. Of 109 operation specimens of carcinoma of the stomach in my series 17, or 15·6 per cent., showed evidence of having originated in a pre-existing simple ulcer.

DIAGNOSIS OF ULCER-CANCER AT OPERATION.

This is likely to be excessively difficult. A pr operative diagnosis should be aimed at. It may b impossible to decide from inspection of the stomac in situ whether the lesion is a perfectly simple chroni ulcer or one in which malignant proliferation ha commenced. The physician, or possibly the physicia and surgeon in concert, should decide on clinica grounds what operative treatment if any is desirabl and this decision should only be modified by ver definite contra-indications presenting themselves a operation. It is equally difficult, in cases of obviou malignancy, to determine at operation whether o not this has originated in simple ulcer, but here th matter has become of academic interest only. I ulcer specimens which have been removed surgicall and in which the interior can be closely inspected i is often possible to form an opinion naked eye as t whether cancer is present or no. Early carcinom betrays itself by irregularity and nodulation of th margin. At the best such an opinion must b provisional and subject to revision on histologica examination. I must confess to having wrongl suspected the presence of cancer naked-eye mo often than I have failed to detect its presence.

Chronic Gastritis.

In the matter of chronic gastritis and cancer I must reserve judgment. Unfortunately most of my material was taken without having this question in view, and while it is possible to say that both in ulcer and in cancer well-marked chronic gastritic changes are common in the lesser curvature region—"pylorus gastritis" of Faber (1927)—I have found little evidence of a generalised gastritis of the cul-de-sac or greater curvature in either of these diseases. Hurst (1929*a*) has shown that the achlorhydria which exists in from 50 to 75 per cent. of cases of carcinoma of the stomach is almost certainly an antecedent condition and not the result of the malignant disease He has never seen a case in which free *hydrochloric* acid was present at an early stage and disappeared as the disease advanced, but he has seen three in which a test-meal was given both before and after the onset of malignant degeneration of ulcer. Hyperchlorhydria was present in two and a normal acid curve in the third. In each the degree of acidity was undiminished when the carcinoma had developed. He quotes two other cases in which achlorhydria existed at least three years before the discovery of inoperable carcinoma. On the other hand, I have seen a case in which there was hyperchlorhydria two years and six months before an exploratory laparotomy for ulcer-cancer, by which time there was achlorhydria except for 20° of free HCl in the half-hour fraction. The patient came to post-mortem a day or two later, having died from perforation of an ulcer-cancer of the upper part of the lesser curvature. There had been a history very suggestive of gastric ulcer extending over nearly 20 years.

Hurst is of opinion that the achlorhydria which ordinarily precedes and accompanies primary carcinoma is the result of long-standing chronic gastritis. Two things have to be taken into account: (1) a chronic gastritis of the pyloric and lesser curvature regions as an actual precancerous lesion, and (2) a pan-gastritis as the cause of the achlorhydria. In my experience a chronic gastritis of the lesser curvature and pyloric regions is very common in cases of gastric ulcer, less common in cases of carcinoma. The lesion varies greatly in severity, and passes through hypertrophic and atrophic stages. At first the stroma is merely overrun by inflammatory cells, lymphocytes and plasma cells particularly, especially in its superficial zone. Later this extends to the deeper parts of the mucosa and there is a notable increase in the amount of lymphoid tissue, both superficial and deep to the muscularis mucosæ. Still later there is atrophy of the secretory glands, which may go on to complete destruction, the mucosa then consisting merely of inflammatory stroma and lymphoid tissue with a covering of simple cubical or columnar epithelium. In a very few cases of this kind I have seen carcinoma arising, apparently as a widespread superficial change. A type of vegetative epithelium is sometimes seen in these cases which might well be regarded as precancerous. The cells and their nuclei are well-stained and the normal content of mucin, in small droplets, is partially or completely lacking. The contrast between this epithelium, which is usually though not invariably limited to the surface zones, and the rest of the epithelium is remarkable, and a point of particular interest is that these hyperplastic cells obviously resist post mortem peptic digestion much more strongly than the others. I believe this to be a real precancerous condition, but am unable to say how often it progresses to malignancy.

Pangastritis of any severity is, in my limited experience, uncommon in both ulcer and cancer. Even in cancer cases with achlorhydria very little change may be present in the mucosa of the greater curvature, the oxyntic cells being apparently well preserved.

Duodenal Ulcer.

Those who argue against a close association between gastric ulcer and cancer usually refer to the remarkable fact that whereas chronic duodenal ulcer is definitely more common than gastric, carcinoma arising within the duodenal bulb is almost unknown. On the other hand, since carcinoma of the stomach is itself a common disease and primary duodenal cancer extremely rare (Table XVI.), this can hardly be regarded as a valid argument.

TABLE XVI.—*Incidence of Primary Carcinoma of the Gastro-intestinal Tract in a Series of 12,800 Autopsies at all Ages (Leeds 1910–31).*

—	Cases.		Percentage Incidence.	
Stomach		322		2·5
Small intestine		12		0·094
Duodenum .. .. .. (Supra-ampullary portion, 1; ampullary portion, 3)	4		0·031	
Jejunum	5		0·063	
Ileum	3			
Ampulla of Vater		4		0·031
Large intestine		473		3·7

The incidence of primary carcinoma of the duodenum in this series, 0·031 per cent., may be compared with the figure obtained by Jefferson (1916–17) from a large series of collected data, 43 cases in 109,201 autopsies (0·04 per cent.).

A more important point is the anatomical distribution of duodenal cancer itself. For this purpose it is usual to recognise three divisions of the duodenum, supra-ampullary, peri-ampullary and infra-ampullary (Fenwick, 1901). In most cases the tumour arises in the peri-ampullary zone, but it is then not always possible to determine whether it has had its origin in the duodenal mucosa or in the ampulla of Vater.

In the Leeds series (Table XVI.) there were four certainly arising in the ampulla, while of four apparently primary duodenal cancers three were peri-ampullary and one only supra-ampullary. The latter was situated 4 cm. from the pylorus—i.e., beyond the usual ulcer-bearing area. Fenwick (1901), in 51 cases of duodenal cancer, found 11 (21·5 per cent.) supra-ampullary, 29 (57 per cent.) peri-ampullary, and 7 (13·5 per cent.) infra-ampullary.[‡] In Geiser's series of 71 cases the distribution was 11 (15·5 per cent.), 51 (71·8 per cent.), and 9 (12·7 per cent.). Probably the lowest site of all is the duodenal bulb, the position in which chronic ulcers or their scars are most frequently encountered.

Jefferson (1916–17) has collected 31 cases of carcinoma regarded as arising in pre-existing duodenal ulcers or scars. They form a thoroughly unconvincing series, though it is just possible that a few of them may be authentic. In Jefferson's own case the tumour was *2·5 cm. from the* sphincter pylori, and there was no sign of ulcer at autopsy. However, a gastro-jejunostomy had been performed some three years or so before, when it was stated that a duodenal ulcer had been found.

Kettle (1930) has reported one of the most convincing examples of ulcer-cancer of the duodenum, yet even in it there are elements of doubt. The histological criteria seem to be beyond cavil. The floor of the lesion was composed of dense sclerotic tissue indistinguishable from that ordinarily seen in chronic duodenal ulcers, there was a wide breach in the muscular coat, occupied by the fibrous tissue above-mentioned, and some of the smaller arteries showed well-developed endarteritis. Carcinomatous tissue was present all round the margin and had slightly invaded the sclerotic floor. There was also some clinical evidence, though not conclusive, of long-standing ulceration. Against ulcer-cancer was the position of the lesion at the junction of the first and second portions of the duodenum 4·5 cm. from the pylorus. Cases of chronic ulcer have certainly been reported in this situation, but they must be extremely rare. In my post-mortem series of 475 chronic lesions of the duodenum, ulcers and scars, all were within the duodenal bulb and not more than 2·5 cm. from the pylorus.

In 15 cases of duodenal carcinoma reported from the Mayo Clinic by Eusterman, Berkman, and Swan (1925), six were supra-ampullary, and in one the tumour was related to the scar of a healed duodenal ulcer.

Bearing in mind the great frequency of chronic ulceration and scarring in this situation it is a justifiable conclusion from a review of the literature that chronic duodenal ulcer is not a precancerous condition.

Diverticulitis.

The frequency and clinical importance of diverticulosis and diverticulitis of the large intestine have only been established in recent years. A very complete and detailed study of the clinical and pathological aspects of the condition was published by Telling and Gruner in 1917 and much admirable work has since been done on the radiological aspect by Spriggs and Marxer (1925) and many others. The condition of multiple diverticula or diverticulosis is a common one. It occurred in 158 of 1901 consecutive patients examined radiologically by Spriggs (1927)—8·3 per cent. Diverticulitis was present in only 17 of these—12 per cent. In 160 cases of diverticulosis examined in the post-mortem room at Leeds 23 (14 per cent.) had diverticulitis.

The occurrence of carcinoma in association with diverticula or diverticulitis was first reported by Hochenegg (1902), and since then scattered case-reports have made their appearance in the literature. Wilson (1911) reported four instances in 15 cases of diverticulosis operated on at the Mayo Clinic, and concluded that this was a definitely precancerous condition. He believed that the malignant changes arose in islets of epithelium segregated by the diverticular and peridiverticular inflammation. Telling and Gruner, who found 11 instances of carcinoma in a collected series of 324 cases of diverticulosis, took a similar view. The Mayo Clinic material has recently been reviewed by Rankin and Brown (1930), who found diverticulosis in 5 per cent. of all persons with large bowel symptoms and estimate the probable frequency in all persons at 1 per cent. Diverticulitis probably existed in 17 per cent. of the cases with diverticulosis. In 227 cases of *diverticulitis* requiring surgical treatment, cancer coexisted in four. In another series of 670 cases operated on for carcinoma of the bowel there were four with *diverticulosis*. They conclude that the relationship is incidental rather than significant.

My own more limited experience supports Rankin and Brown's view. In 160 cases of diverticulosis of the large intestine there were six with carcinoma coli, but of these only three were situated in the diverticula-bearing region. Twenty-three of the 160 cases were the seat of inflammatory changes, but only one of the six cases of malignant disease occurred in this group and there was nothing to suggest that it was of diverticular origin. In a discussion following a paper on diverticulitis and cancer by D. F. Jones (1930) Fallon mentioned that in a review of the Mayo Clinic records, including 1800 cases of diverticulosis, of which 625 showed diverticulitis and 19 carcinoma, and 1600 cases of carcinoma coli, of which 19 showed evidence of previous diverticulitis, he found only one case in which there was reasonable evidence that the carcinoma had arisen in a diverticulum. It may be concluded that diverticulitis is of no practical importance as a precancerous condition.

[‡] In the remaining 8 per cent. the disease involved the whole or greater part of the duodenum.

CARCINOID TUMOUR OF THE APPENDIX AND SMALL INTESTINE.

The appendix shares with the small intestine a remarkable immunity from the ordinary varieties of epithelial cancer, contrasting in this respect with the stomach and large intestine. In the appendix the neoplasm most frequently encountered, though even this is rare, is the well-known carcinoid tumour (Oberndorfer, 1907), now recognised (Gosset and Masson 1914, Masson 1924, 1928) to be a derivative of the neurogenous Kultschitzky cells which line the bottom of the crypts of Lieberkühn. These cells, of endodermal origin, bud outwards and invade the periglandular and subglandular nerve plexuses of the mucosa stimulating them to neuromatous overgrowth, a process most likely to happen in organs already the seat of an old obliterative inflammatory lesion.

Carcinoid tumours arise by neoplastic proliferation of these invading "neurocrine" cells, which, at first confined within the nerve sheaths, presently burst out into the connective tissue of the submucosa and invade the muscular coats. It is a slowly growing tumour of epithelial type, resembling in many respects the basal-cell carcinoma of the skin. It rarely disseminates to the regional lymph glands, and still more rarely to the liver or other organs (Stewart and Taylor, 1926). Its most frequent site is at the tip of the appendix. In the small intestine, where it occurs but rarely, it is usually multiple.

The association with old inflammatory disease of the appendix is well established (Kennedy 1909, 1910; Oberndorfer 1928), the tumour apparently arising in segregated portions of the mucous membrane which have had their continuity with the rest of the lumen and with the intestine interrupted by obliterative fibrosis.

So far as the small intestine is concerned no antecedent inflammatory lesion has been described. Those interested may be referred to the comprehensive studies of Masson (1924, 1928) and Forbus (1925).

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AN OUTBREAK OF RABIES IN TRINIDAD

WITHOUT HISTORY OF BITES, AND WITH THE SYMPTOMS OF ACUTE ASCENDING MYELITIS.

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RECORDS of rabies are of the greatest antiquity, dating back to the fifth century B.C. Though until comparatively recently it was believed that in the dog and wolf the contagium arose de novo, from the time of Aristotle onwards the human disease has always been associated with the bite of a rabid animal. While, for various reasons, in isolated cases no history of trauma may be available, an outbreak such as the present, in which no history of bites can be elicited, has never been described, and no other mode of transmission is recognised. Again, while paralytic rabies is not uncommon, an epidemic consisting solely of cases of the paralytic type is unprecedented. The facts we are about to record will, therefore, prove of interest alike to the neurologist, the epidemiologist, and the student of filterable viruses.

Description of the Epidemic.

EPIDEMIOLOGY.

History.—In July, 1929, there occurred in the village of Siparia in south-western Trinidad a case of acute ascending myelitis; this was followed within three months—i.e., during the rainy season—by 12 others. In the opinion of the local medical practitioners the cases constituted a distinctly unusual clinical entity. During the period July–August, 1930, three further cases were observed, and one early in 1931, when Sir Wilfred Beveridge visited the island on behalf of the Colonial Office. All 17 cases terminated fatally. At first localised to Siparia and its neighbourhood, the disease later spread further north towards the oilfield area.

Race.—The disease was confined to natives of the labouring class, who walk with bare feet. Well-to-do natives and Europeans have so far been unaffected. Of the 17 cases, three were members of the East Indian race, the others Negroes or descendants of Negroes.

Age and sex.—The age-incidence is interesting and is shown below:—

1929.		1930–31.	
0–5 years	1		
6–10 ,,	4	6–10 years	1
11–15 ,,	3	11–15 ,,	1
16–20 ,,	2	30–35 ,,	1
26–30 ,,	3	36–40 ,,	1

It is to be noted that in the 1929 cases a large proportion were in children of school age (the first two

(*Continued from previous column.*)

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cases occurred in the same school), and that the disease was not uniformly spread over the various age periods. Eleven males were affected and six females. In two instances more than one case occurred in a single household; in one the illness of a lad of 15 (still attending school on account of backwardness) was followed by that of his father, and the eighth case was a sister of the first.

Animal morbidity.—During the period covered by the present epidemic, the only disease prevalent among animals was one diagnosed as botulism in cattle, horses, donkeys, and mules; this will be dealt with later. With this exception, no undue prevalence of disease in wild or domestic animals has been noted during the last six years, though the inquiry respecting animal morbidity extended even to the mongoose and vampire bat. No case of rabies has been recognised since 1914. Quarantine laws are of the strictest and, except for animals coming from the United Kingdom, no dog can enter the island without a quarantine of at least six months and inspection and certification by the Government veterinary surgeon. In no instance was there history of a bite, nor on admission to hospital was there any evidence of injury.

The possibility of transmission by biting flies and insects was also considered, but with similar negative results. The mosquito and stomoxys fly are not more prevalent in the district affected than in other parts of the island.

Every case on notification was immediately removed to hospital and isolated. The premises were disinfected and the schools closed.

CLINICAL FEATURES.

From a clinical standpoint the cases formed a fairly homogeneous group with the characteristic and definite symptomatology of an ascending myelitis. Until experimental investigations were made, the outbreak was considered by some practitioners as probably one of acute poliomyelitis; this was rendered more likely by the fact that in the earlier cases no sensory changes were detected.

The onset was usually acute with fever and often headache. In many cases symptoms began with a sensation of burning and tingling, usually in the foot or leg, but sometimes in the back, and curiously enough nearly always on the left side; in some, retention of urine or paresis of the legs was the first sign. After one to four days, weakness of the leg became apparent, and developed more or less rapidly into complete paralysis, with loss of the tendon and plantar reflexes. The other limb and the trunk muscles were soon affected. Retention or incontinence of urine and constipation were present in every case. One to several days later, extension of the paralysis to the muscles of deglutition and respiration led to increasing difficulty in swallowing, dyspnœa, extreme restlessness, and invariable death. In some cases paralysis of the arms preceded the fatal termination, but in others considerable power still remained at the time of failure of respiration. Sensory changes appear to have been of variable occurrence; in only some of the patients was a loss of sensation to touch, pinprick, and heat and cold reported to extend upwards to the level of the pelvis, umbilicus, or lower ribs. Except for periods of delirium, the sufferers usually retained consciousness, and could answer questions intelligently until the end; in a few cases, however, drowsiness marked the middle stages of the illness, and at the close the patient was unconscious.

A swinging temperature varying from normal to 103° F. or higher was accompanied by profuse sweating, which was a very marked feature in nearly every case; as a terminal event the temperature sometimes rose to 104° F. or higher. As a rule the pulse and respiration increased in rate progressively as the state of the patient worsened. There was no nausea, vomiting, or cutaneous eruption.

It must be emphasised that difficulty in swallowing, associated in some cases with dribbling of saliva, occurred only in the terminal stages when paralysis of the bulbar muscles was obvious; hydrophobic symptoms were never present in the early stages. In Case 2 alone (see below) did spasmodic difficulty in swallowing during the later stages suggest to the doctor in attendance that the case "looked like one of hydrophobia." General muscular spasm was absent during the whole course of the illness; in several cases, however, stiffness of the neck was observed. Nervous symptoms were never preceded by a stage of excitement. At the height of the disease the cases had the anxious facies seen before the crisis in pneumonia, but clinically and post mortem the lungs were normal. Death was due primarily to respiratory failure and not to syncope.

With the exception of ptosis in one case, ocular paralyses were absent, as was optic neuritis in the patients examined from this point of view.

Examination of the blood and urine was always negative; no malarial parasite was found. Lumbar puncture was performed in five cases. The cerebrospinal fluid was perfectly clear and not under pressure; examination showed increase of globulin and contaminating organisms, but no cells. Circumstances, however, did not permit examination until about 12 or 16 hours after removal. Bacteriological investigation of throat and nasal swabs threw no light on the causation of the malady.

In 13 cases the duration of the illness was from four to eight days. One case died on the 3rd, one on the 10th, one on the 21st, and one on the 30th day.

The histories of the cases on which experimental work was carried out are set forth below.

CASE 1.—Female Negro labourer, aged 28, well-nourished and well-developed. Admitted August 20th, 1930, with a four days' history of pain and burning in the left foot.—August 21st. Numbness of left leg with absent knee-jerks and some loss of sensation in the foot.—August 22nd. Both legs weak, but patient still able to extend and flex at the knees and hips. Loss of sensation of left foot as far as ankle. Profuse sweating. Lumbar puncture yielded a slightly turbid fluid under moderate pressure, and showing, 12 hours later, some increase of globulin but no cells.—August 23rd. Weakness more marked and sensation lost in both legs as far upwards as the middle of the calves. 9 P.M. Complete paralysis of both legs with loss of sensation to the hips. Patient restless and sweating profusely. Periods of delirium, but questions answered rationally. Catheterisation necessary.—August 24th. Bladder and abdomen distended. Paresis of arms now apparent. Difficulty in swallowing. Dyspnœa. Loss of sensation to umbilicus. Death at 7 P.M.

CASE 2.—Female Negro schoolgirl, aged 10. Admitted to hospital Jan. 24th, 1931, with two days' history of fever, pains in the right lower limb, and difficulty in micturition. On admission she complained of pain in the right lumbar region radiating to the thigh and iliac fossa. Temperature, 99.8° F; pulse-rate, 112; respiration, 24. No weakness of limbs and no sensory loss. No retention of urine. Condition remained unchanged during next day.—Jan. 26th. Rapidly developed flaccid paralysis of lower limbs, with loss of sensation and incontinence of urine. Tendon reflexes abolished.—Jan. 27th. Temperature, 100° F.; pulse-rate, 136; respiration, 24. Profuse sweating. Weakness of arms with marked dyspnœa and difficulty in swallowing; the medical attendant thought that patient looked like a case of hydrophobia. Complete paralysis with loss of sensation in legs. Incontinence of urine. At 4 P.M. dyspnœa became worse, and inability to swallow was absolute. Profuse sweating continued. Lumbar puncture yielded a clear fluid under moderate pressure; 16 hours later no cells were seen. Death at 7 P.M.

POST-MORTEM FINDINGS.

The meninges over the brain and cord were congested, but no purulent exudate was present. In cases dying after three or four days the cord was of normal consistency, but the cross-section showed congestion and loss of demarcation between the grey and the white matter. In those succumbing after seven or more days the cord was much softer than normal, and in the lumbar region was often almost diffluent; these observations were made within a few hours of death, and were, in consequence, not attributable to post-mortem degeneration.

Except for congestion the other organs showed little departure from normal; in the heart, however, petechial hæmorrhages occurred with some frequency, especially along the line of junction between auricles and ventricles.

Material sent from Trinidad for histological study unfortunately miscarried, and at the time of writing only a single section from Case 1 and a piece of cord from Case 2, preserved in glycerin and fixed later in formol-saline, are available for section.

The section from Case 1 shows in both grey and white matter marked perivascular infiltration with large and small lymphocytes, a few large mononuclears and occasional polymorphs. There is diffuse infiltration of the grey matter with proliferated microglial cells and a few lymphocytes and polymorphs. Many of the anterior horn cells are well preserved, but some show complete chromatolysis, and others marked degenerative changes accompanied by neuronophagia. From this single section it is impossible to draw definite conclusions, as the appearances are compatible with a diagnosis either of poliomyelitis or of rabies.

In the second case the dorsal cord shows only occasional slight cuffing of the vessels, and most of the nerve-cells are normal. A few Babes nodules are present. No Negri bodies are to be seen. The appearances here are in keeping with a diagnosis of rabies.

Experimental Investigation.

Pieces of spinal cord from Case 1 and of a number of regions of the central nervous system from Case 2 were placed in sterile glycerin and forwarded to the Lister Institute.

Since, from the data available at the time, it was considered likely that the disease was poliomyelitis, the spinal cord of the first case was inoculated in doses of 1 or 2 c.cm. of a 10 per cent. emulsion in sterile saline into the left parieto-occipital lobe of each of four monkeys (*Macacus rhesus*). After incubation periods of 15, 17, 17, and 42 days respectively, the animals developed rather curious symptoms less characteristic of rabies than those observed later in passage animals. The following protocol is typical of three of the cases.

M.420. Received Nov. 25th, 1930, 2 c.cm. of a 10 per cent. spinal cord emulsion in the left parieto-occipital lobe.—Dec. 10th. Found clinging to the bars of its cage uttering repeated and peculiarly piercing shrieks quite unlike the normal cry of the monkey. These cries were emitted only during observation, and on withdrawal of the observer they ceased; the animal appeared to be in a state of extreme terror. It showed a disinclination to move, but when pushed off the bars of its cage its movements were quite active.—Dec. 13th. The animal now squealed continually, whether observed or not. It appeared to be generally weak, but no definite localised paresis could be detected. No muscular spasms were observed. The previous day's food had been left untouched.—Dec. 15th. The monkey had a staring gaze, and seemed unaware of the presence of food, of its cage-mate, or of the observer. It squealed continually, and the cries were much weaker than before. On interference it did not attempt to bite. The chin was abraded from constant picking with the fingers. Muscular spasms did not occur and no definite paralysis or rigidity was present. The animal was very emaciated, with a subnormal temperature, and as it seemed unlikely to survive until next day it was etherised.

The fourth animal behaved otherwise

M.444. Received Nov. 25th, 1930, 2 c.cm. of a 10 per cent. emulsion in the left parieto-occipital lobe and 3 c.cm. intramuscularly.—Dec. 12th. The animal showed some tendency to squeal like the others, but, from the first, localised weakness was apparent in the legs. During the next few days it gradually became more sleepy.—Dec. 16th. Paresis of the legs was now marked. The monkey lay apparently asleep on the floor of its cage, and though it could be momentarily roused it immediately lapsed into somnolence.—Dec. 17th. The animal was very sleepy, and completely apathetic, even to painful stimuli. Flaccid paralysis was present in the legs. In the arms, which fell limply to the side when released, considerable power still persisted, so that the apparent weakness seemed due to the animal's mental condition. Thus after repeated stimulation it could be induced to grasp the observer's finger; when suspended in the air the animal once more lapsed into somnolence, its grip gradually relaxed, and eventually it fell to the ground. No muscular spasms occurred. Later in the day the temperature was subnormal, and the animal was etherised.

At *autopsy*, definite macroscopic changes were noted only in M.444, which showed several hæmorrhagic areas in the lungs and intestines. Cultures, aerobic and anaerobic, from the brains of all four animals remained sterile for ten days.

In animals inoculated from the above, the symptoms were typical of rabies, and very similar to those in a monkey infected with the *virus fixe*. After a short period, in which the animal was actively aggressive, and in one case killed its cage-mate, violent muscular spasms, occasionally sufficient to throw the animal bodily across the cage, occurred and gradually passed into a stage of general weakness ending in death. In different cases one or other of these manifestations predominated; convulsions might persist almost to the end or, from a very early stage, great general weakness, associated once with definite paralysis of the legs, might be the most conspicuous feature. In some cases nystagmoid movements of the eyes were observed, and the animal nearly always wore a dazed expression. Three animals bit themselves severely, two chewing off the end of a finger, and one the whole skin of the forearm, exposing the muscles from the elbow to the wrist. The onset of symptoms was sometimes heralded on the preceding day by a rise of temperature, but more often no temperature disturbance was noted. The incubation period varied between 6 and 11 days, and was commonly 7 to 9 days; death frequently occurred within 12 hours, and always within 48 hours of the first symptom. The disease has now been transmitted to five generations of monkeys by intracerebral or intraneural inoculation; unfiltered emulsions and Chamberland LI *bis* filtrates have alike been effective.

Some difficulty was experienced in establishing the original monkey virus in rabbits, and at first it could not be taken past the first or second passage, but ultimately by choice of suitable animals the seventh generation was reached. The symptoms were typical of paralytic rabies, and indistinguishable from those due to the *virus fixe*.

Material from the second human case was inoculated intracerebrally into a monkey and several rabbits. The rabbits all died from sepsis due to contaminating organisms in the inoculum, and further rabbits injected subcutaneously with brain emulsion or intracerebrally with a Berkefeld N filtrate remained well over a period of three months. The monkey survived with a localised cerebral abscess, and on the thirty-eighth day developed typical rabies; from its brain the disease was transmitted without difficulty to four generations of rabbits.

In all the experimental animals lesions characteristic of rabies existed in the central nervous system. Only some of the rabbits showed well-developed Negri bodies; in the monkeys, without exception, typical Negri bodies with "innerkörperchen" were present in the cornu ammonis, and often in other parts of the brain and cord.*

Cross-immunity tests between the Trinidad virus and the *virus fixe* (Paris strain) are not yet completed. As far as they go they reveal a partial cross-immunity between the two viruses, inasmuch as immunisation with the *virus fixe* protects against the intracerebral inoculation of Trinidad virus while the reverse does not obtain. The sera of animals immunised with *virus fixe* neutralises to an equal degree the two viruses. The final results of these tests will be published later; at the moment there seems no reason to doubt the close relationship of the two viruses, though the Trinidad virus appears to be poor antigenically and unable to protect against the highly virulent *virus fixe*.

The Disease of Cattle.

Since July, 1925, a disease diagnosed as botulism has occurred in cattle and the equidæ. In that year among various herds, totalling approximately 450 head, in and around the Queen's Park, Savannah (Port of Spain), there were 46 deaths. Outbreaks of the disease have since appeared throughout the island; cases have been less numerous around Siparia than in districts free from the human malady. Local veterinary surgeons, most of whom were thoroughly acquainted with the condition as seen in the United States and Canada, agreed that the disease was botulism, as did Dr. Robert Graham, of Urbana, Illinois, and Dr. G. E. Jacobi, of Minneapolis. Further, in two instances, one of us (J. L. P.) isolated the *Bacillus botulinus* from the liver and spleen by means of Bengston's cooked meat medium (1924), and Dubovsky and Meyer's medium (1922); the organism was also found in samples of soil and water from "infected" pastures. There seemed, therefore, no reason to doubt the diagnosis made.

The main symptoms consisted in constipation, grinding of the teeth, salivation, tremor and involuntary movements, muscular incoördination, and finally prostration, respiratory failure, and death; the disease evolved in the absence of any rise of temperature.

The owners of cattle among the labouring classes are mostly East Indians, who tend their animals with the same affectionate care as their compatriots in India, and are thus brought into close contact with them. Despite this fact only three of the 17 cases of the human disease occurred in East Indians, and in no single instance has even a remote connexion been established between a human case and infected cattle or their secretions. Epidemiologically, therefore, there seemed to be no connexion between the human and the bovine disease.

Nevertheless, from the brain of a cow suffering from so-called botulism we have obtained a virus similar to that from the human cases, while in the cornu ammonis of a second cow typical Negri bodies were detected. It appears, consequently, either that botulism and rabies exist side by side and are clinically indistinguishable, or, more likely, that the cattle disease is rabies, and the finding of the *B. botulinus* a chance occurrence unconnected with the real cause of death. Further investigation of this problem is proceeding, as are cross-immunity tests with the cattle virus and the *virus fixe*.

Discussion.

Consideration of the facts adduced leaves little doubt that the virus responsible for both the human and the cattle disease is that of rabies. That this conclusion could hardly have been foreseen in the early stages of the investigation was due to the unusual form taken by the disease in the human cases and the invariable, complete absence of any history of bites. Before proceeding to a discussion of these difficulties it would, perhaps, be well to summarise briefly the essential facts in our knowledge of rabies.

The symptoms of classical rabies are too well known to require mention, and it is to the histological features that we may first direct attention.

HISTOLOGICAL FINDINGS IN RABIES.

Since the description of Negri bodies (Negri, 1903) more and more trust for the histological diagnosis has been placed in the demonstration of these structures; occurring, as they do, in over 90 per cent. of the cases in man and animals (Negri Luzzani, 1913; Dwijkoff and Bogoslowskij, 1929), they are undoubtedly one of the most constant findings in the central nervous system.

Neuronal and inflammatory lesions, showing no regional affection corresponding to the site of the bite, are variable in degree and distribution; Dawydowski and Dwijkoff (1928) base their diagnosis largely on the absence of changes typically associated with other diseases. Schükri and Spatz (1925) and Lowenberg (1928) state that the intensity of the pathological processes is related to the length of the incubation period, but many other authors have failed to detect any such relation. Meningeal infiltration with lymphocytes and plasma-cells or occasionally with polymorphs (Lowenberg) is usually not marked, and this applies also to perivascular cuffing with the same types of cell. Certain modern authors (Klarfeld, 1922; Schükri and Spatz, 1925; Slotwer, 1926) find most marked inflammatory changes in the substantia nigra and midbrain, and some comment on the difficulties of diagnosis from encephalitis lethargica; others (Marchand, 1920; Krinitzky, 1926; Dawydowski and Dwijkoff; Bassoe and Grinker, 1930) place the most severe lesions in the floor of the fourth or the wall of the third ventricle, and even contrast their situation with that of the changes in encephalitis lethargica. Foci composed chiefly of proliferated microglial cells, the rabic nodules of Babes (1892) considered by him to be specific for rabies, are met with chiefly around the damaged motor nerve-cells of the brain-stem and cord. Lesions in the nerve-cells, consisting in chromatolysis, swelling, vacuolation or other degenerative changes, followed sometimes by neuronophagia, may be confined to the anterior horns of the spinal cord and the bulbar nuclei (Marchand; Lesieur, Lhermitte, and Jacquet, 1910), or may also occur in the cerebral cortex, basal ganglia or Purkinje cell layer of the cerebellum (Klarfeld, Lowenberg, Krinitzky, Dawydowski and Dwijkoff); it is, however, an interesting and important fact that the cells of the cornu ammonis containing the most numerous Negri bodies are usually comparatively intact. Cajal and Garcia (1904), Marinesco (1910), and others emphasise hypertrophy of the neurofibrils as a constant cellular abnormality in rabies; other observers (Marchand; Lesieur, Lhermitte, and Jacquet) have noted lysis of these structures. Goodpasture (1925) has described peculiar changes in the neurofibrils and mitochondria leading to the formation of Negri bodies, and Tupa (1929) swelling and disappearance of the mitochondria and of the Golgi apparatus.

The cerebro-spinal and sympathetic ganglia are frequently the seat of lymphocytic infiltration with marked destruction of nerve-cells, which are replaced by masses of small cells forming the nodules of van Gehucten and Nelis (1900); Dawydowski and Dwijkoff find the Gasserian ganglion most commonly affected. Chachina (1926) describes alterations in the sympathetic ganglia in each of ten cases. Nicolau, Nicolau and Galloway (1929) find scanty infiltrative lesions in the peripheral nerves.

It must, however, be recognised that none of these changes is necessarily an accompaniment of rabic infection; not only are many of them absent in some human cases, but in *virus fixe* infection it has long been recognised (Babes, 1912, &c.) that with increasing affinity of the virus for the nervous system of the rabbit, lesions tend to become less and less noticeable. Examination of several cases bitten by the same animal led Dawydowski and Dwijkoff to the conclusion that individual capacity for reaction varies greatly. The species of animal infected is also responsible for variations in the histological picture; França (1925), from a comparative study of rabies in a number of different animals, concludes that the only constant lesion is hypertrophy of the neurofibrils.

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* When these findings were reported to Dr. Pawan, I was informed by him that a report in similar terms had been received from Dr. Simon Flexner, of the Rockefeller Institute, to whom also specimens of the first case had been sent.—E. W. H.

PARALYTIC RABIES AS A CLINICAL ENTITY.

Turning now to less usual clinical manifestations of rabic infection, the question of paralytic rabies, which incidentally is normal in herbivora and rodents, immediately enters the field of inquiry. The occurrence of this clinical type in man has been recognised since the time of Gamaleia (1887), and though numerous cases have since been described but little can be added to his description. It is commonly held that such cases are more particularly apt to arise after extensive bites—e.g., by rabid wolves—where the infecting dose of virus is presumably very large, and after bites on the limbs rather than of the face. A study of the literature gives the impression that they occur more frequently when Pasteur treatment has failed to prevent the onset of rabies. This impression may, of course, be fallacious for two reasons: firstly, that even where prophylactic measures are abortive only the cases of atypical course are recorded; secondly, that the cases in which treatment is of no avail are most likely to be those receiving an overwhelming dose of virus. It is not irrelevant here to recall that the cases of paralytic rabies arising during or after antirabic treatment must be sharply differentiated from those of the so-called paralytic accidents, in which the lesions (Fielder, 1916; Stuart and Krikorian, 1928, 1930; Bassoe and Grinker, 1930), quite different from those of rabies, are identical with those in post-vaccinal encephalitis.

According to Gamaleia, the symptoms of paralytic rabies begin with fever, malaise, headache, and vomiting. Pain is felt usually in the bitten part, but may take the form of girdle-pain. Paresis beginning in the bitten limb is accompanied by fibrillary contractions, and rapidly increases to complete flaccid paralysis; if noted at all, sensory loss is of late development. Preceded by pains, the paralysis spreads to the other limbs, the trunk, rectum, and bladder; the face, tongue, and eyes are not spared. The respiratory centre is involved more or less late in the course of the illness, and to a greater or less degree; dyspnœic convulsions may occur, but death results from cardiac paralysis. The total duration of the malady is, on an average, seven and one-half days, compared with three days for the ordinary form of the disease. The symptoms prove that the whole of the grey matter of the cord is affected —i.e., there is a "total poliomyelitis."

Among others, van Gehucten (1908), Babes (1912), Higier (1912), Marie and Chatelin (1919), Lubinski (1921), Uribe (1924), Fedoroff (1925), Knutti (1929), Gutmann (1930), and van Wulfften Palthe (1930) have reported cases, while Remlinger (1906) accepts rabies as a cause of Landry paralysis.

These later cases have often been described under the term Landry paralysis, and have sometimes, during life, been diagnosed as poliomyelitis. Four have arisen in untreated patients; in the remainder antirabic treatment was in progress or had been completed. In the majority the bite was on the hand or leg, but in at least one (Marie and Chatelin) the boy was bitten (slightly) on the lip. As premonitory symptoms, many of the cases have shown depression or other psychical disturbance, together with pain in a leg or in the scar resulting from the bite; anxiety or depression have often been marked during the course of the illness. All evolved with ascending paralysis as the dominant clinical feature; sensory loss was definite only in Knutti's patient, and here, as will be seen later, the pathological changes were of a different order from those in the remainder. In Higier's case general hyperæsthesia was noted. In many, but not in all, retention or incontinence of urine and fæces was present. In roughly half, paralysis of the muscles of articulation and deglutition, with difficulty in swallowing, occurred during the terminal stages. Salivation was a feature of several cases. Hydrophobic spasms have been described by van Gehucten. From a perusal of his article it seems likely that here they were of psychical origin; the patient had expressed a fear of becoming rabid, and hydrophobia was elicited only by attempts to swallow water and not other liquids or saliva. In two other cases difficulty in swallowing, presumably spasmodic, appeared early in the illness. Ocular paralyses have been unusual, but have been recorded by van Gehucten and van Wulfften Palthe. In every instance death has followed within 4–12 days from respiratory or cardiac paralysis, or from a combined failure of the two vital centres, and has often been preceded by dyspnœic attacks. In most of the instances cited, the diagnosis has been confirmed by the finding of Negri bodies, by animal experiments or by both methods; in the remainder no reasonable doubt exists regarding the diagnosis.

Koch (1912) described a case of ascending paralysis accompanied by anæsthesia but without hydrophobia, and coming on during antirabic treatment. Partial recovery had occurred when two months later the patient succumbed to sepsis. Some of the animals inoculated with cord emulsion died of sepsis; the remainder died after long incubation periods of a condition corresponding to "consumptive rabies," without showing, bacteriologically or otherwise, a definite cause for death. Koch believed that the rabic virus was responsible for the paralysis.

Concerning the frequency of this form of rabies, Höyges (quoted by Babes, 1912) saw 12 cases among a total of 86, Koch 2 among 8, and Dawydowski and Dwijkoff 20 among 94. No previous author has described a series of 17 consecutive cases all of the paralytic variety, and unattended by any examples of the classical disease.

HISTOLOGICAL FINDINGS IN PARALYTIC RABIES.

The lesions in these paralytic cases are often not described, while in others they appear to have been similar to those in typical rabies.

In van Gehucten's case the cord showed no vascular lesions and only some chromatolysis of the anterior horn cells, though severe changes were found in the spinal ganglia; he comments on the lack of correspondence between clinical symptoms and pathological alterations.

Higier reported the presence in the spinal cord, and to a less extent in the pons, of marked perivascular cuffing, with diffuse lymphocytosis affecting particularly the anterior horns and following to some extent the grouping of vessels and nerve-cells; chromatolysis was evident in the anterior horn cells and in the Purkinje cells of the cerebellum, and Babes nodules existed in the pons.

In Fedoroff's case the most intense lesions, congestion, perivascular and tissue infiltration, were situated in the spinal nerve-roots, while in the cord some perivascular cuffing was unaccompanied by abnormality in the nerve-cells; a double central canal with surrounding gliosis representing a developmental defect may have predisposed to the abortive result of treatment.

Marie and Chatelin describe the changes present in their patient as an acute infiltrative polio-encephalomyelitis. Perivascular and parenchymatous infiltration, with nerve-cell degeneration, existed alike in the spinal ganglia, grey matter of the cord, medulla and pons, cerebellar cortex, and parts of the cerebral cortex; these changes attained their maximum in the ganglia and cord. In the latter infiltration was largely nodular, with hypertrophy of neurofibrils, disappearance of the nuclei of the nerve-cells and considerable neuronophagia; anterior and posterior horns were equally involved. In the brain-stem infiltration was less marked and more diffuse. In the cerebellum the inflammation was localised to the Purkinje cell layer; in the cerebrum the cornu ammonis was particularly affected, though the nerve-cells were well preserved.

Gerlach (1925) does not record the clinical course of his case, though presumably it was of the type under discussion. He found a diffuse, in places hæmorrhagic myeloencephalitis, with complete softening of the lumbar cord. Lesions in the cord, situated chiefly in the grey matter, consisted in diffuse lymphocytic and leucocytic infiltration, massive perivascular and pericellular infiltration with advential elements and leucocytes, and all degrees of nerve-cell degeneration up to complete destruction. Inflammatory changes continued into the brain-stem and basal ganglia, where however they were much scantier.

As he claims, Knutti's observations are unique, since in contrast to the foregoing accounts he describes destructive lesions of both grey and white matter of the cord. In the lumbar region he found pial infiltration with lymphocytes and plasma-cells. In the white matter extensive diffuse destruction had left no fibres intact, and the tissues were uniformly infiltrated with lymphocytes and with mononuclear leucocytes containing phagocyted nuclear material and fat. (The illustrations suggest that the latter cells were microglial.) The vessels showed lymphocytic sheathing. Necrosis and infiltration with all stages of degeneration in the nerve-cells were seen in the grey matter; most of the large motor neurons had disappeared, and the remainder contained Negri bodies. In the posterior nerve-roots, numerous foci of destruction of axons and myelin sheaths gave rise to spaces containing granular material, lymphocytes, plasma-cells, and large mononuclears; the anterior roots showed far less severe alterations. Animal experiments were positive. In this case there was no history of a bite, and ten days prior to her illness the patient had been vaccinated against small-pox; she had had no reaction. The vaccine used was tested for rabies virus with negative results. The nature of the lesions in the nervous system, together with the presence of Negri bodies and the positive animal inoculation, seems to rule out completely the possibility of post-vaccinal encephalitis, which might otherwise have been suspected.

THE TRINIDAD DISEASE AND THE POSSIBLE VECTOR.

The cases described in the present paper are interesting for a variety of reasons. All were of the paralytic type, and in the absence of, or with failure to detect sensory changes, the earlier cases were accepted as examples of the Landry syndrome; it seems desirable that cases with this diagnosis—e.g., that of Viswanathan, 1929—in countries where rabies is common, and even in those apparently free from the malady, should be investigated experimentally.

It is very difficult to envisage a cause for the unusual clinical features. We shall shortly discuss whether, in spite of the absence of history, the patients had been bitten by rabid animals; however this may be, to escape notice the bites cannot have been deep or extensive, as they usually have been in paralytic rabies in man. Nor do the experimental results suggest that the Trinidad virus is either more or less virulent than the average street virus. Remlinger and Bailly (1930) failed to obtain evidence of the plurality of the rabic virus, which varies only in its activity and aggressivity, but the possibility of a modification of the virus in a manner analogous to that of the small-pox virus in alastrim, or in an opposite direction, must receive consideration. There is no indication in the literature that rabies takes an unusual form in races other than European, and the victims in Trinidad have belonged to two totally distinct racial stocks. Individual predisposition can hardly be a factor in each of 17 cases.

A somewhat similar modification of the symptomatology of rabies is witnessed in the "oulou fato" of dogs in West Africa; here fury, normally seen in canine rabies, is very rare, and the manifestations are almost wholly paralytic. It has, in fact, been questioned whether the disease is rabies and whether it is transmissible to man, though the work of Remlinger and Curasson (1924), Laigret (1926), Dabbadie (1930), Remlinger (1930), and others has established beyond doubt its identity. But in the exceptional cases of transmission to man, exceptional probably because the animals show little tendency to bite, there is no record of an abnormal clinical picture. Woodhead (1906) stated that, whereas in dogs generally the malady takes the paralytic form in 15–20 per cent. of cases, in Turkey nearly all cases assume this form.

The bearing of the findings of Kobayashi (1925) on the problem in hand depends on the interpretation placed upon his results. In the Japanese encephalitis epidemic of 1924, believed to be encephalitis lethargica, Kobayashi succeeded in isolating from a single case a virus capable of indefinite transmission in animals. He himself recognised its affinity with the *virus fixe*, and Cowdry (1927) demonstrated that it was in fact a true rabic virus. If the Japanese findings could be accepted unreservedly, they would indicate the ability of the rabic virus to give rise to a clinical condition differing widely from classical hydrophobia. Apart, however, from the fact that the virus was obtained from only one of a number of cases investigated, symptoms in the experimental animals did not appear until the third passage, leaving some uncertainty whether the virus originated from the human material or not.

It is unfortunate that the accident mentioned prevented a detailed histological study of the Trinidad material. In Case 2, lesions in the cord appear to be scanty, as frequently happens in this region in typical rabies. In Case 1 much more marked changes, probably as severe as those described by Marie and Chatelin and by Gerlach in their paralytic cases, are present. From the fact that many of the cords examined have shown, macroscopically, complete softening in the lumbar region, we may per that Case 1 is in this respect the mor of the group. It will be interesting, if further cases occur, to see whether any of these individuals with myelitic symptoms show the unusually severe lesions described by Knutti.

Concerning the transmission of the disease in Trinidad we have no definite information. The epidemiological evidence indicates that the human affection as a whole is not directly connected with the cattle disease. Cow's milk is consumed by the native population, but there is evidence available (Mugrage, 1930) against the possibility of inducing rabies by feeding with the milk of rabid animals, so that treatment of persons drinking the milk of infected cattle is not necessary. From analogy with rabies elsewhere, we should, however, be disposed to look for a common vector of the two outbreaks. The biting of cattle by a rabid animal, especially if small and less obtrusive than a mad dog, might easily pass unnoticed; can we assume that 17 human beings might be bitten without their knowledge? The following work of Haupt and Rehaag (1921) may conceivably furnish an answer.

Haupt and Rehaag described a severe enzoötic in Brazil from 1908 onwards. In one district, between 1913 and 1918, 30 per cent. of the total horses and 15 per cent. of the cattle died of rabies. No rabid dogs were known to exist, and wholesale destruction of dogs made no impression on the case-incidence. It was then noticed that a swiftly flowing *river impassable to dogs proved no barrier to the spread of* infection, and that the heaviest mortality occurred in the most thickly wooded districts. Vampire bats (*Phyllostoma superciliatum*, Burmeister†) were next noticed to fly by day—an exhibition of quite abnormal behaviour; cattle bitten by these bats afterwards developed rabies. Finally, experimental investigation of a bat caught biting a cow *confirmed the supposition that these creatures were the* vectors.

It may be that here we have the clue to the origin of the Trinidad epidemic, and investigation along this line is proceeding. Vampire bats occur in the island, which lies within a short distance of the mainland of South America, and are known to bite men and animals; in explanation of its illness, the owner of the cow from which rabic virus was isolated stated that "bats had sucked the life out of the animal." Moreover, a bat may bite a person during his sleep without his being aware of the occurrence, and the toe is a common site for the trauma; we might thus account alike for the absence of history of bite and for the frequency, as the initial symptom, of paræsthesiæ in the foot. In connexion with the cattle disease, it has many times been remarked that removal of the herd from pasture to stall results in cessation of the epidemic; this was previously attributed to its removal from an area infested with *B. botulinus*, but, since lanterns are always kept burning in the stalls to scare away bats, an alternative explanation is forthcoming. If the outbreak is finally traced to bats, is it possible that passage of the virus through that animal's tissues has in some way modified its pathogenic action for man, so that it now produces only cases of paralytic type? Should the present line of inquiry yield negative results, it seems that we must search for a new and hitherto unrecognised mode of transmission of the disease.

In conclusion, we must acknowledge our indebtedness to Sir Wilfred Beveridge for placing his notes freely at our disposal, and to Dr. W. M. Scott for a supply of *virus fixe*.

Summary.

An outbreak of human rabies, which in each of 17 cases *took the paralytic form*, is described; in no instance is a history of bite by a rabid animal forthcoming.

The simultaneous occurrence of rabies in cattle is reported.

Epidemiological evidence does not suggest a direct connexion between the human and the cattle disease.

The opinion that the vector in both cases may be the vampire bat is *tentatively expressed*.

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ST. JOHN AMBULANCE BRIGADE.—Last year members of the brigade attended 451,370 cases of accident and sudden illness. In his annual report Sir Percival Wilkinson, acting chief commissioner of the brigade at home, states that at the end of last year there were 1794 divisions and a personnel of 55,121, while 362 cadet divisions had a membership of 7356. The net increase in strength during the year was 103 divisions, 2752 members, 203 cadet ambulance divisions, and 343 nursing divisions. The work has increased with especial rapidity in London, and in the past two years the strength of No. 1 (Prince of Wales's) District has consequently been augmented by 1171 members.

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† Captain J. G. Dollman, of the Natural History Section of the British Museum, kindly informs us that the blood-sucking vampire bats belong to three genera—desmodus, containing the common South American vampire *D. rotundus* and the Central American *D. rufus*; diæmus, from South America; and diphylla, from Brazil. The blood-sucking bat of Trinidad is the *D. rufus*.

SHOULD HIGH BLOOD PRESSURE BE REDUCED ?

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THE question whether high blood pressure ought or ought not to be reduced is of great practical importance. An attempt has been made here to decide it by an experimental method. The idea underlying the investigation is to reduce the pressure artificially and to determine the cardiac reserve power as well as the renal function under the altered conditions.

Twenty-two patients were put on a standard diet, which was rigidly enforced for three weeks. During the first week no drugs were given; during the second week pressure-reducing drugs were administered; in the third week again no medicine was given. Collosol sulphur (Crookes), 3 c.cm. daily, was injected intramuscularly in the majority of cases; the effect of this drug on pressure is both profound and lasting. Erythrol-tetranitrate was, however, employed in some cases. The following tests were applied each week: water-excretion test, water pituitrin excretion test, blood-urea, blood non-protein nitrogen, blood uric acid, alkali reserve, blood chlorides, chloride concentration test, blood phosphates, and ammonia coefficient.

TABLE I.

Case.	First week.				Second week.				Third week.			
	Systolic Bp.			N.P.N.*	Systolic Bp.			N.P.N.*	Systolic Bp.			N.P.N.*
	Max.	Min.	Av.		Max.	Min.	Av.		Max.	Min.	Av.	
1	200	170	180	36	170	155	163	40	180	160	165	36
2	225	225	225	41	215	190	200	46	225	225	225	42
3	185	145	165	35	160	120	140	39	180	130	145	37
4	—	—	—	31	—	—	—	40	—	—	—	35
5	120	100	115	35	115	105	110	36	110	100	105	32
6	190	145	170	36	140	90	120	40	150	130	140	40
7	205	190	195	34	220	150	190	42	175	145	160	38
8	—	—	—	38	—	—	—	38	—	—	—	36
9	190	165	175	37	170	140	160	44	170	135	150	43
10	220	180	200	39	185	170	175	45	185	170	175	47
11	240	180	220	40	226	150	185	35	—	—	—	35
12	—	—	—	36	—	—	—	45	—	—	—	40
13	165	145	150	34	140	115	133	38	155	140	150	35
14	180	145	160	35	170	130	147	35	160	135	150	35
15	170	160	165	43	170	140	155	48	155	145	150	39
16	150	120	133	36	145	110	127	42	135	120	127	40
17	270	240	250	49	250	200	225	70	260	235	240	55
18	195	170	180	37	170	155	165	42	180	150	170	38
19	185	140	157	39	170	140	152	47	140	135	140	42
20	150	140	145	40	135	120	123	46	145	120	130	45
21	210	190	197	38	200	140	170	49	210	175	195	37
22	195	180	183	33	175	145	168	38	170	140	160	39

* Expressed as mg. per cent. nitrogen.
Av. = Average.

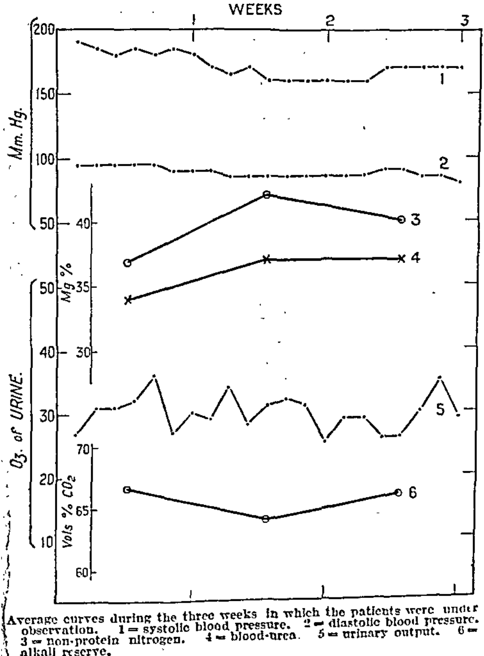
RESULTS OF TESTS.

Water excretion was normal in all the cases under review as long as no pressure-reducing drugs were employed. During the period in which patients were under the influence of pressure-reducing drugs the great majority of cases showed a marked reduction in the water-excretion power. In one instance, however, there was an increase in the water excretion in the second week when the patient was under the influence of the pressure-reducing drugs. The drug employed in this case was erythrol-tetranitrate, which, as already seen, does not exercise a lasting effect on pressure.

Perhaps as significant a fact as any is the marked reduction in urinary output during the period the patient was under the influence of pressure-reducing substances. The reduction is particularly marked in cases of polyuria. It is clear that such an elementary function as water excretion becomes depressed in cases where pressure-reducing drugs are employed.

Blood-urea was increased in all cases during the period of observation when the patient was under the influence either of collosol sulphur or of erythrol-tetranitrate, 40 mg. of urea per 100 c.cm. of blood being considered the limit of normal blood-urea values. In the first week all cases but two showed normal blood-urea content. Under treatment, there were actually eight cases which showed an abnormally high blood-urea of 40 mg. upwards. It is obvious that there is definite urea retention in cases of high blood pressure after the administration of pressure-reducing drugs.

Non-protein Nitrogen.—There was only one patient out of 22 who did not show an increase of non-protein nitrogen when under the influence of pressure-reducing drugs. This patient showed also an increase of alkali reserve when under the influence of



Average curves during the three weeks in which the patients were under observation. 1 = systolic blood pressure. 2 = diastolic blood pressure. 3 = non-protein nitrogen. 4 = blood-urea. 5 = urinary output. 6 = alkali reserve.

pressure-reducing drugs. Non-protein nitrogen retention is doubtless evidence of functional failure of heart or kidney; for the purpose of this paper it does not matter which.

Alkali Reserve.—This test represents the buffer value of blood plasma. If free acids stronger than carbon dioxide are produced in the body they replace it from combination with the buffer salts and so diminish the alkali reserve power. As is well known, under normal conditions the kidney excretes a large amount of acids in order to maintain the pH equilibrium. A failure on the part of the kidney to excrete the acids would thus lead to a diminished alkali reserve.

Alkali reserve was generally diminished as a result of the administration of pressure-reducing drugs. In the great majority of instances there was retention of uric acid, phosphates, and chlorides, and the chloride excretion test was depressed.

The figure shows the average variation in blood pressure, non-protein nitrogen, blood-urea, urinary output, and alkali reserve in the 22 cases over the three weeks' test period.

CARDIAC CONDITION AND PRESSURE-REDUCING DRUGS.

The cardiac power was tested the first week, when the systolic pressure remained normal, and the second week, when it was reduced. There are a number of reactions practised at the Heart Hospital[1] which give a definite indication of the cardiac condition. Foremost among these is the relation of stroke volume at rest to stroke volume at work. It was found in the normal heart that the stroke volume (cardiac output per beat) is greatly increased as the result of exercise. In the diseased heart, on the other hand, the increase is only moderate or is absent. The same standard test was used in all cases. Similarly the cardiac output per minute after work is larger in health than in disease. Another important test refers to the time in which the oxygen consumption becomes normal after the standard exercise. The shorter the period in which the oxygen consumption becomes normal the better the condition of the heart.

TABLE II.—*Cardiac Output and Stroke Volume under Conditions of Reduced and Unaltered Pressure.*

Case.	Before and after reduction of pressure.	During rest.		After standard exercise.		Requirement in c.cm. of oxygen.	Time after exercise in minutes when oxygen consumption becomes normal.
		A = Cardiac output per minute in litres. B = Stroke volume in c.cm.					
		A	B	A	B		
18	Before.	5·4	72	10·5	100	1916	12
	After.	5·5	62·5	8·96	74	2172	20
22	Before.	4·8	53	9·9	97	1752	12
	After.	4·5	48	7·5	64	2290	16
19	Before.	5·8	56	11·4	95	1132	11
	After.	4·7	50	8·7	78	1668	12
6	Before.	5·6	54	11·5	108	2016	8
	After.	4·6	50	8·8	97	2132	12

Yet another important reaction refers to "requirement." By this term is understood the cost of oxygen which a standard exercise entails. The worse the condition of the heart, the greater the consumption of oxygen. Table II. gives a clear indication of all these reactions in the first week, when the systolic pressure was not disturbed, and in the second week, when the pressure was reduced.

These tests prove conclusively that the heart suffers definitely as a result of treatment by pressure-reducing drugs. This result is not difficult to understand, as an adequate pressure in the aorta is of vital importance for the coronary circulation.

Various attempts have been made to seek the cause of hypertension in various substances circulating in the blood, but with little success. Might it not be an endeavour on the part of the organism to keep the blood chemistry within normal limits? This may be the reason why nothing really abnormal is found in the blood chemistry as long as the blood pressure remains high. It is only when the pressure is reduced artificially, and thus a condition of artificial heart failure brought about, that there is abnormal retention of substances in the blood in these cases.

CONCLUSIONS.

(1) The water-excretion function is definitely depressed as a result of administration of pressure-reducing drugs. (2) There is retention of urea, non-protein nitrogen, phosphates, and chlorides in the blood as a result of pressure-reducing drugs, while the alkali reserve is generally lowered. (3) The cardiac function is definitely impaired as the result of the treatment. (4) The conclusion is that it is not desirable to administer pressure-reducing drugs as routine treatment in cases of hypertension.

The cardiac output determination was done by one of us (I. H.) and Dr. I. J. Lipkin.

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[1] Edin. Med. Jour., September, 1931.

IODINE POWDER IN THE TREATMENT OF CHRONIC OTORRHŒA.

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ASSISTANT SURGEON TO THE CENTRAL LONDON THROAT, NOSE, AND EAR HOSPITAL; SURGEON FOR DISEASES OF THE EAR, NOSE, AND THROAT TO THE QUEEN'S HOSPITAL FOR CHILDREN.

IODINE powder, consisting of a 1 per cent. intimate suspension of iodine crystals in boric acid, is a valuable adjunct to the treatment of chronic uncomplicated suppurative otitis media associated with a marginal perforation and granulations. This type of case invariably proves resistant to ordinary conservative treatment and an operation is the usual advice profferred. The powder is one highly spoken of by American otologists.[1] It is termed iodine powder because the iodine is the active principle and the boric powder chiefly the vehicle for application. It is made by grinding up iodine crystals with boric acid in a mortar.

In deciding what line to adopt in the treatment of quiescent chronic uncomplicated otorrhœa, it is necessary to divide the cases into certain clinical groups: (1) Those with a central perforation of adequate size in the tympanic membrane. These cases, with one or two exceptions, can be cured instantly and dramatically by a single ionisation with zinc sulphate. (2) Cases with a marginal perforation—a large number of these cases can be cured by treatment with iodine powder. (3) Cases of cholesteatoma, for which operation is indicated. (4) Cases with an intact tympanic membrane but with fistula into the mastoid process, on the posterior or superior wall of the osseous meatus. A mastoid operation will be necessary for this class.

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[1] Lederman, M. D.: Laryngoscope, 1930, xl., 397.

TREATMENT OF THE MARGINAL PERFORATION.

The tympanic membrane has a perforation, which extends to and involves the annulus tympanicus and is associated with granulations, which are sessile, pedunculated, or may be simulated by pouting mucous membrane. The posterior superior quadrant is the common site. After thorough cleansing of the meatus, it is often possible to aspirate secretions from the attic. The meatus is thoroughly cleansed by syringing and mopping. All adherent sloughs are removed and the pent-up secretion aspirated with the Siegle speculum. Any large granulation is removed after the application of cocaine and adrenalin. The meatus is filled with absolute alcohol for ten minutes and then thoroughly dried by mopping. A 1 per cent. iodine in boric acid powder is insufflated into the meatus, filling it completely. The patient is instructed not to touch the ear, except to mop out any discharge with a cotton-wool applicator. He is seen at intervals of four days at first, but later at intervals of seven days, when the ear is again insufflated with the iodine powder without any further preliminary treatment with alcohol. This is repeated until the ear heals—usually within two months.

The treatment is painless and the iodine does not produce any effect on the skin of the meatus. If the powder is still to be seen at the weekly visit, the discharge has diminished to a minimum or has ceased completely. To obtain a view of the tympanic membrane it will then be necessary to remove the powder by syringing. If the lesion is present (in the early stages it is often present but quiescent, presenting a pale picture, compared with its congested red appearance at the commencement of treatment) the powder is again insufflated. If there is any doubt whether there is any discharge or not, the powder test should be applied. This consists of insufflating boric powder and seeing the ear next week. The presence of the powder, undisturbed and snow-white, is proof positive of the absence of any discharge in the interim.

Effects of the Iodine Powder.—The profuse discharge rapidly abates, often after the first application, the ear remaining free from any overt discharge. Thus, as far as the patient is concerned, a "cure" of the otorrhœa has been wrought. He is freed from a troublesome discharge and is rid of the ritual of a daily aural toilet. Though at this stage otoscopy would reveal the absence of any powder and the focus is still active, the patient is delighted with the results. Parents are pleased that no active treatment is required from them at home. The fœtor of the discharge will disappear, and within a week or two the otorrhœa becomes inodorous, gradually muco-purulent, mucoid, and, in successful cases, finally ceases completely. The sessile granulations shrink up, as does the œdematous prolapsed mucous membrane pouting down from the attic region and from the periphery of the perforation. A rapid epithelisation occurs, and within a few weeks will be complete.

I have repeatedly observed a cure of the otorrhœa in cases with a marginal perforation with granulations. Many of these cases had failed to react to all other forms of active treatment and it appeared that *only* operation was left, yet the iodine powder cleared up the condition. It is interesting that these cases heal by migration inwards of the periphery of the perforation, so that the latter assumes a central position, where it may remain patent or may completely close over.

I have also found the powder cure cases where there has been a central perforation, but not with the dramatic effect of zinc ionisation. Cases of central perforation with granulations on the periphery of the perforation are cured by the powder.

If there is any active discharge the powder never cakes or obstructs. It acts as a sponge, absorbing secretions. It only remains in situ if the discharge has ceased.

REPRESENTATIVE CASE REPORTS.

CASE 1.—A boy, aged 7, had had right and left ear discharge for two years, with occasional bleeding from the right ear but no pain. When seen on Nov. 24th, 1930, he had septic tonsils and adenoids. The right meatus was full of offensive pus: when this was removed a marginal perforation, situated in the upper posterior quadrant of the drum, was seen. Excessive granulations surrounded and occluded the perforation, which involved the annulus tympanicus. Secretions could be aspirated with the Siegle speculum.

The ear was cleaned and dried. Absolute alcohol was applied for ten minutes; the excess was mopped away and the meatus filled with 1 per cent. iodine in boric acid powder. On Dec. 1st no discharge was complained of, and the meatus was moist. It was filled again with iodine powder. On Dec. 8th there was no discharge, but there was no trace of the powder in the meatus. Silver nitrate was applied to the granulations, and iodine powder again applied. On Dec. 15th the ear was dry and iodine powder was reapplied. On Jan. 12th, 1931, the ear was dry, and on Jan. 26th the perforation was healed, and the child heard normally.

He had also had pus in the left meatus, the condition being the same as in the right ear, with attic granulations. The treatment was identical with that of the right ear, and within the same period the discharge had dried up completely and the perforation had healed.

No treatment is carried out in the interval between the attendances, but the frequency of insufflations must depend on the rapidity with which the discharge appears.

CASE 2.—A girl, aged 9, had had purulent, offensive discharge from the right ear, but no pain, for 12 months. She had had her tonsils and adenoids removed six months previously. When seen on Nov. 4th, 1930, she had a marginal perforation occupying the postero-superior quadrant of the tympanic membrane and annulus, surrounded by exuberant granulations, from which, after the ear had been thoroughly cleaned, offensive secretions, indistinguishable from cholesteatomatous debris, could be aspirated with the use of the Siegle speculum. Absolute alcohol was applied for ten minutes; the meatus was dried and filled with iodine powder. On Nov. 11th there was marked improvement; the pus was not so profuse in amount and not offensive. The meatus was again filled with iodine powder. On Nov. 18th there was no discharge, and the meatus was moist. Iodine powder was reapplied then, and again on Dec. 2nd and 9th. On Jan. 27th, 1931, the ear was dry, a dry perforation remaining.

CASE 3.—A girl, aged 11, had had purulent discharge from both ears continuously for seven years. There was no pain. She had been attending the out-patient department of a teaching hospital for months, but had never had tonsils or adenoids removed. When seen on May 9th, 1930, both ears had the meatus full of offensive pus. This was cleaned. Adherent offensive slough occupied the depth of the meatus, deep to which the entire meatus was occupied by a perforation which extended to the annulus tympanicus in all visible directions. Granulations pouted from the margins, and pus could be aspirated from the attic. For the three subsequent months she was treated with repeated zinc ionisations with little effect, the meatus being found to have a purulent slough in its depth each week. It was decided to advise operation. When the iodine powder treatment came under my notice this case was one of the earliest put on it. In the meanwhile the tonsils and adenoids were removed. On Sept. 12th the condition of both ears was the same as in May. Alcohol was applied for ten minutes, followed, after drying, by the iodine powder. This was repeated each week to both ears for six weeks, at the end of which period both ears were completely free from discharge. The patient was seen again in December, 1930, when the ears were dry and there was a complete *restitutio ad integram* of both tympanic membranes. The mother commented on the fact that this was the first time for seven years that the ears had ceased from discharging. Six months later the ear were still dry.

CASE 4.—A woman, aged 28, had had discharge from the left ear for many years, necessitating a daily aural toilet to keep the ear clean and free from odour. There was no pain. A perforation was observed through Shrapnel's membrane, marked by the usual sentinel granulations and extending on to the roof of the osseous meatus. It was covered by a yellow adherent slough, and a bent probe detected bone. The granulations could be sucked out of the perforation. Alcohol was applied, followed by iodine powder, and the treatment was repeated on Sept. 27th. One week later the ear had not run in the interval, though there was no trace of any powder left in the meatus. The powder was insufflated at weekly intervals, and within a month the ear ceased to discharge, and the patient was very impressed. The ear dried up completely.

I have treated over 300 cases with very gratifying results. The vast majority of these cases were between the ages of 5 and 15. Unfortunately, it is not possible to foretell which cases will respond to the iodine powder treatment or which will prove a failure. Many cases respond, much to the observer's surprise; while others, in which a good result should ensue, fail. But the treatment is well worth a trial before recourse to the radical operation.

CLINICAL AND LABORATORY NOTES

CASE OF
ASBESTOS-LIKE BODIES
IN THE LUNGS OF A COAL-MINER WHO HAD NEVER WORKED IN ASBESTOS.

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AND

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In March of this year a man, aged 71 years, was seen in consultation with a doctor ten miles from Manchester, and was later admitted to the Manchester Royal Infirmary under the care of one of us (F. E. T.). The doctor who had attended him reported that he had had several attacks of hæmoptysis in the preceding month, but as several recent sputum tests had had negative results the case had not been accepted by the local tuberculosis authorities.

The man himself said he was a coal-miner, and had as a young man worked in Alabama in mines. On consulting books of reference it was found that no asbestos is found in Alabama, which is noted for coal and iron, "Alabama iron" being famous all the world over. In 1923 it is stated that 80 per cent. of the asbestos produced came from that part of Quebec which is south of the St. Lawrence. Alabama and Lancashire mines were the only mines he had ever worked in. These points later became of interest and importance owing to the curious findings at the post-mortem and in the histological examinations of portions of tissue removed thereat, and later examined by one of us (J. S. D.).

On examination on admission to the hospital the man was very thin, obviously much emaciated, and very weak. There was a history of typhoid fever in December, 1929, and of operation for a strangulated inguinal hernia in December, 1930, since which time his health had never fully recovered. On Feb. 19th, 1931, he had his first hæmoptysis, spitting up "about four pints" of blood, while a few hours later a second hæmoptysis occurred. A cough had been constant since then, whilst the sputum remained blood-tinged and night sweats occurred. A week before admission a rigor occurred, and delirium followed, and persisted up to the time of admission. Examination of the chest showed nothing abnormal on the left side beyond the presence of a few râles and rhonchi over the lower part of the left lung behind. On the right was massive dulness, more marked below. Well below the apex at the back and to the outer side were signs of cavitation. The area of dulness surrounding the area of cavitation gave no evidence of softening to auscultation, but there was rather an absence of breath sounds. Low down in the right axilla friction was heard. A tentative diagnosis of pulmonary tuberculosis was made, with possible new-growth supervening. In the next 48 hours a positive sputum test was obtained. A blood Wassermann taken about this time was negative. The Widal reaction was positive to *Bacillus typhosus* 1 in 160.

Radiographic examination of the chest reported: "As the patient was unable to sit up satisfactory examination was impossible. The film taken shows displacement of the heart and mediastinum towards the right side. There is a large irregular opacity in the right lower chest, with mottling in the upper and middle lobes. There is some mottling also visible in the left middle and lower lobes. The appearances are not typical of tuberculosis, ? neoplasm."

The urine contained a trace of albumin. The pulse-rate at first was 90–100, but later rose to 116–120. The range of temperature was morning, 98°; evening, 99°–100°. He gradually got weaker, and died on April 14th. The autopsy was held on the 15th.

A synopsis of the post-mortem findings follows, with a description of the histology and some notes on these findings by one of us (J. S. D.).

REPORT OF AUTOPSY.

Lymph glands: Thoracic and abdominal glands along spinal column are heavily anthracosed.

Pericardium: About 100 c.cm. excess fluid.

Heart (400 g.): Enlarged; myocardium, hypertrophy, more marked right side; tricus. V, three fingers; mitral V, two fingers; aorta, early atheroma.

Right and left pleuræ: Each 500 c.cm., straw-coloured fluid. Right lung (900 g.): Whole of lower and lower half of upper lobe are firm, almost black with white mottling, and at apex of lower lobe a cavity containing

FIG. 1.

Asbestos-like bodies in the lungs, showing forms, with rounded ends. In Fig. 3 the central core can be clearly distinguished. (× 500.)

a ruffled wall and evidence of tubercle. Left lung (1300 g.): Lungs showed some degree of softness, as though some neoplastic invasion were present. Both lungs heavily anthracosed. Left consolidated only in its lower lobe. *No abnormalities evident in air passages.* General appearances suggest a chronic fibroid tubercle, possibly associated with a neoplasm.

Stomach: Nil. Small intestine: Some small tuberculous ulcers in lower ileum. Large intestine: Tuberculous ulceration of cæcum.

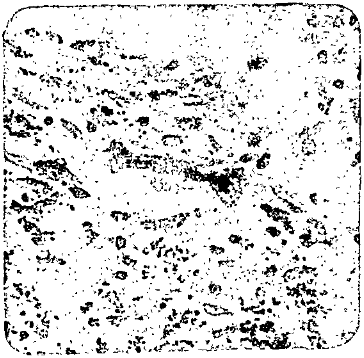
Liver (1600 g.): Moderate passive congestion. Pancreas: Nil. Spleen (310 g.): Enlarged and moderately firm. Hyperplasia and congestion. Thyroid: Nil. Adrenals: Nil. Right kidney (160 g.): Congested. Left kidney (160 g.): Congested. Urinary bladder: diverticula present. Genital glands: Middle lobe of prostate quite appreciably enlarged.

Anatomical diagnosis: Chronic fibroid tuberculosis of lungs. Pulmonary asbestosis.

HISTOLOGICAL EXAMINATION.

The extensive consolidation of the lower lobes of both lungs was found to be due to caseating tuberculosis with a very diffuse distribution; it appeared to represent a rapid lymphatic spread, and in large areas it completely obscured the lung-structure. Tubercle bacilli were present in moderate numbers.

FIG. 2.



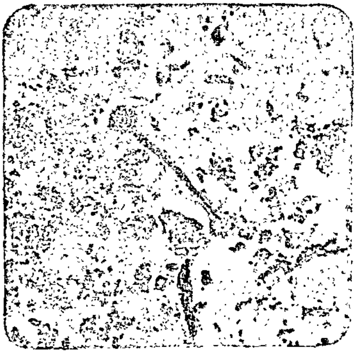
There was fairly marked anthracosis, the pigment in fine granules, being mostly aggregated in the peribronchial connective tissue.

The upper parts of the upper lobes were almost free from tuberculosis, and so it was possible to recognise a moderate patchy overgrowth of fibrous tissue in these areas. This was mature in type, but not very dense, and did not form laminated nodules. Here and there in the fibrous tissue were scattered some minute brownish bodies singly or in groups of *five to ten* (Figs. 1 and 2). They were mostly slender *rods with bulging ends*, and they measured from 30 to 70 microns in length by 2 to 5 microns in thickness. On high-power examination, it could be seen that most of these bodies had a black opaque *central core*, while the brown material formed an outer lamina and was semi-transparent (Fig. 3). There was no appearance of the regular segmentation *which commonly occurs* in asbestos bodies. On treatment with potassium ferrocyanide and hydrochloric acid, the brown material took on an intense *blue colour*, evidencing an abundant content of free iron. The bodies were subsequently recognised in all parts of the lungs, though nowhere numerous.

COMMENT.

The main point of interest in the case is the occurrence in the lungs of bodies which somewhat resemble those that have been described in the lungs of asbestos workers. They simulate these in size and general shape, especially in the rounded swellings at the ends; in colour; and in their abundant content of free iron. They differ from the familiar asbestos bodies in being usually coarser and less regular, in possessing a black core of opaque material, and in the absence of any appearance of segmentation. *It is presumed that they are minute fragments of* some other iron-containing mineral, which have been inhaled into the lungs and undergone some chemical change under the influence of the tissue fluids resulting in the formation of a peripheral lamina from the iron-containing part. They do not appear to have caused a very serious fibrous reaction in the lungs in this case.

FIG. 3.



GALLOP RHYTHM:

ITS CLINICAL SIGNIFICANCE IN CERTAIN CASES.

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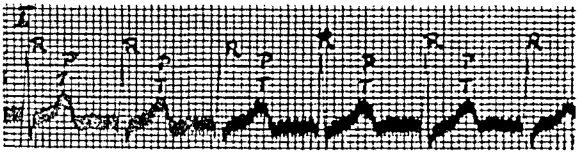
GALLOP rhythm has long been known to be a serious cardiac sign. The name is best reserved for the true gallop rhythm where the first heart sound is reduplicated (⏑⏑—); for, in agreement with Gee's teaching, a doubling of the second sound (—⏑⏑) is properly termed canter rhythm. It is important to differentiate between the two, for canter rhythm is heard in many conditions none of which is as serious as those which yield gallop rhythm. These two rhythms are easily confused, for even a slight degree of tachycardia may appear to accentuate the middle component of the three (⏑—⏑); and during the varying phases of respiration this accentuation will seem to move sometimes to the third component (⏑⏑—), sometimes to the first (—⏑⏑).

It is here desired to draw attention to a special variety of gallop rhythm, and to emphasise the importance of its recognition. For according to the age at which it appears it may be the only sign which either allows for the provision of adequate treatment or leads to a correct diagnosis and a more clear prognosis. This special variety is a reduplication of the first sound, clearly heard, over a small area close to the left border of the sternum at the second intercostal space or third cartilage. In many cases it will be heard at all the auscultatory areas; but if it is not audible at this localised spot, it is unlikely to be heard elsewhere. There are, of course, many cases where gallop rhythm is heard at the mitral area, yet not at the base; these belong to a different category.

ACUTE RHEUMATISM.

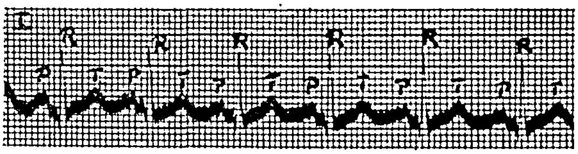
The significance in acute rheumatism varies with the age of the patient. In children and young persons it is almost always associated with delayed conduction from auricle to ventricle, the electrocardiogram showing a lengthened P–R interval. These two features, gallop rhythm and long P–R interval, are frequently the earliest evidence of rheumatic carditis. Tachycardia, about 120 per minute, is usually present, while the temperature may not be raised above 99° F. The discovery calls for immediate rest in bed; the earlier this is obtained, the more quickly does the P–R interval close. Administration of full doses of salicylates in addition appears to hasten the closure. If treatment is delayed or imperfectly carried out, the P–R interval may remain permanently longer than normal, and the gallop rhythm will then persist.

FIG. 1.



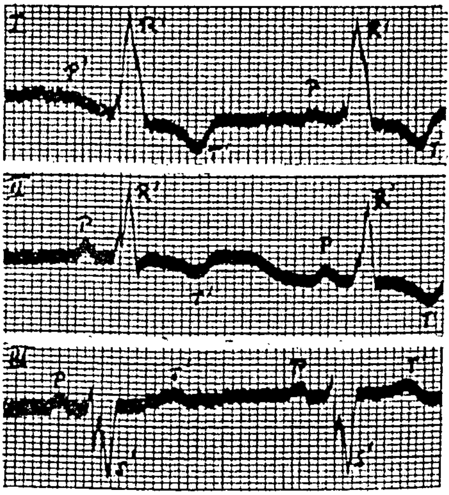
CASE 12.—Aged 15 years. Jan. 30th, 1929. Slight rheumatic pains. Gallop rhythm and tachycardia present; no other abnormal cardiac signs. Lead I. rate = 114. P. and T. fused. P–R = about 0·31 sec.

FIG. 2.



Same case.—Feb. 12th, 1929. No symptoms. No gallop rhythm. Rate = 95. P–R = 0·20 sec.

FIG. 3.



It is probable that the lengthened P–R interval is due to an infiltration of the auriculo-ventricular junction rather than to vagal effect, for atropine produces no alteration except in occasional cases. However, the effect of atropine on the P–R interval is a complex one, and as yet imperfectly understood. Sound-photographs seem to show that the earlier of the two short components is produced as a result of auricular contraction occurring outside its usual timing in the cardiac cycle.

Eighteen cases of this nature have recently been observed in patients under the age of 25 years. In each case a lengthened P–R interval was confidently predicted prior to electrocardiogram. Confirmation was clearly obtained in 17 cases; the eighteenth proved within normal limits. With early treatment, serial electrocardiograms on successive days revealed a rapid closure of the P–R interval; pari passu the gallop rhythm became less clear. Consequently, for purposes of confirmation it is necessary to take an electrocardiogram on the same day on which the gallop rhythm is clearly heard. Figs. 1 and 2 are electrocardiograms from a typical case.

CASE 1.—Girl, aged 15, seen in out-patient clinic at St. George's Hospital, on Jan. 30th, 1929, complaining of mild rheumatic pains in legs and arms; headaches; easily fatigued. No breathlessness or cyanosis. No history of scarlet fever or definite rheumatic fever. On examination, tachycardia, 116, persisting with rest and not due to nervousness. Temperature normal. Heart normal in size, regular rhythm; sounds normal except for reduplication of the first sound at the second left interspace near the sternum; no murmurs. Clinical diagnosis: First degree A–V block, probably rheumatic. Confirmed by electrocardiogram (Fig. 1) on same day. Admitted to hospital for rest in bed, no special treatment. Heart-rate gradually slowed, gallop rhythm became less clear. On day after admission, atropine sulphate gr. 1/25, subcutaneously, produced no effect on the P–R interval. Feb. 12th: Clinically normal, no gallop rhythm. Electrocardiogram normal (Fig. 2). November, 1930: Signs of early mitral stenosis. Electrocardiogram: P–R normal.

Effective treatment was denied to another girl in the first instance, owing to the true nature of her trouble being unrecognised. Now after several years' observation, gallop rhythm is still in evidence and the P–R interval remains abnormally long.

CASE 2.—Girl, aged 10, came to out-patient clinic at Victoria Hospital on May 6th, 1927, complaining of fainting attacks with loss of consciousness for 3–5 seconds. Scarlet fever at age of 7. No rheumatic history. On examination pulse 120, persistent, regular. Temperature normal. Heart normal in size. Apical first sound loud and slapping. First sound reduplicated at pulmonary area. Electrocardiogram confirmed clinical diagnosis of first degree rheumatic A–V block. P–R = 0·23 second for rate = 125 per minute. The parents refused admission to the Victoria Hospital and sought advice at another hospital, where apparently the nature of her trouble was not recognised, and no rest was ordered.

April, 1928: Returned to Victoria Hospital, still suffering from fainting attacks. Gallop rhythm still present. Electrocardiogram: P–R = 0·24 second for rate = 110 per minute.

No subsequent treatment, however, has been effective, and the clinical state and the electrocardiogram remain practically unchanged at the present time.

BUNDLE-BRANCH BLOCK.

In adults of middle age and older this form of gallop rhythm usually indicates a block in one branch of the bundle of His. It is more clearly heard when the right branch (old nomenclature) is affected. Fig. 3 is the electrocardiogram from a case of this nature, following a correct clinical diagnosis based on gallop rhythm heard clearly at the second left interspace, and at no other place; there was here no other clinical feature to suggest the diagnosis. Sound-photographs seem to indicate that in these cases the two short components are due to a slight asynchronism in the closure of the mitral and tricuspid valves.

Of 25 recent cases of bundle-branch block (B.B. block) gallop rhythm was clearly heard in 20; in the remainder the first sound in the second left interspace was not distinctly doubled, but was prolonged. Of the 20 cases with gallop rhythm, 12 were at the time practically symptomless; routine examination revealed the doubled first sound, suggesting a diagnosis of B.B. block prior to its confirmation by electrocardiogram. In other cases electrocardiogram revealed B.B. block when no doubling of the first sound had been observed; re-examination then showed a distinct reduplication in several of them. A definite diagnosis of B.B. block does not indicate any special treatment, but it certainly defines the prognosis more clearly than would be otherwise possible.

It is not contended that gallop rhythm is heard in all cases of first degree A–V heart-block and of B.B. block, nor that all cases of gallop rhythm yield an abnormal electrocardiogram. Rather is it claimed that its recognition in many cases may be of the utmost importance to prognosis and treatment.

BRITISH MEDICAL ASSOCIATION.

ANNUAL MEETING IN EASTBOURNE.

SECTION OF NEUROLOGY AND PSYCHOLOGICAL MEDICINE.

Dr. H. **Crichton-Miller** took the chair at a meeting of this section when Dr. W. A. **Caldwell** gave a survey of probable prognostic factors in the treatment of

General Paralysis.

Pyrexia induced by malaria remained, he said, the most satisfactory method of treatment of general paralysis. Its value was enhanced by a short course of tryparsamide before inoculation and by the administration of N.A.B. after the malarial infection had been terminated. In general it was true that the younger the patient the better the prognosis, but age was not of paramount importance, and improvement might occur in the elderly. Nevertheless 71 per cent. of patients who were discharged from mental hospitals in a satisfactory condition were under 40 years of age. In women who had borne children the prognosis as to discharge from hospital was better than in nulliparous women. The character of the mental symptoms present was an indication as to the probable response to treatment. The expansive grandiose patients, who in his experience were the commonest, did best, and the juvenile and depressed paretics worst. In the case of the simple dements the outlook was moderately good. Dr. Caldwell stressed the importance of early treatment after the onset of symptoms of general paralysis. Those subjected to treatment during the first five months of their illness yielded the best results. There appeared, however, to be no relationship between prognosis and the incubation period which intervened between the primary infection and the development of general paralysis. He had observed a number of cases in which the Wassermann reaction had been negative in the blood but positive in the cerebro-spinal fluid.

Dr. F. R. P. **Taylor** said he had experienced some difficulty in inoculating women with malaria. He inquired as to the advisability of infecting with malaria a paretic woman who was pregnant.

Dr. C. **Worster-Drought** had found the demented type of paretic to be commoner that the grandiose. He questioned the occurrence of a negative Wassermann reaction in the blood in general paralysis, and emphasised the importance of a paretic Lange curve in the cerebro-spinal fluid.

Sir **James Purves-Stewart** remarked that the prognosis depended largely upon the stage at which the physician recognised the disease.

Dr. **Caldwell**, in reply, said that if a patient proved resistant to infection with the benign tertian parasite it was often possible to inoculate him with the quartan variety. He had treated a pregnant woman with malaria without ill-effects.

Exophthalmos of Central Origin.

Dr. W. **Russell Brain** read a paper on exophthalmos associated with organic disease of the central nervous system. Exophthalmos might, he said, occur in conjunction with paralysis of ocular movement either of the supranuclear or of the nuclear type. The conjugate ocular palsies found were usually in the vertical plane. Internal ophthalmoplegia occurred less frequently. Either retraction or ptosis of the upper lids might be present. Hyperglycæmia and glycosuria were common in these cases, and the thyroid might or might not be enlarged. The pathological nature of the causative lesion was often obscure. Encephalitis lethargica was responsible for some cases, and in another group the blood pressure was raised. Those patients in whom exophthalmos was associated with ophthalmoplegia and thyroid enlargement were of great interest, though ætiologically obscure. Exophthalmic goitre and myasthenia gravis had been described as occurring in the same patient. He showed lantern slides of ten of the cases described, and concluded that it seemed impossible to draw a hard-and-fast line between exophthalmic goitre and certain cases of organic lesions of the mid-brain.

Sir J. **Purves-Stewart** inquired whether there was any evidence of disease of the pituitary gland or of the cavernous sinus in the cases reported.

Dr. **Douglas McAlpine** pointed out that enlargement of the thymus was common to both exophthalmic goitre and myasthenia gravis.

Dr. **Russell Brain**, in reply, said that pituitary disease had been excluded in his patients, and that the ocular palsies were not characteristic of cavernous sinus disease. He hoped that further investigation of these obscure cases might throw light upon both exophthalmic goitre and myasthenia gravis.

Psychic Pain and the Psychoses.

Dr. H. **Devine** considered that psychic stress was not an important factor in the causation of the psychoses. If in a given case it appeared to be so there was usually a history of pre-existing mental abnormality. After discussing the biological significance of pain, Dr. Devine said that it seemed to be part of the scheme of things that life should have to struggle in a hostile environment. The difficulties of life could not be diminished by improving external conditions, and if in fact external factors were an important cause of psychical illness little could be done to prevent it. Schizophrenic patients renounced the pain and struggle of life and passed into a state which, as Jung had pointed out, resembled normal dreaming. They showed a deterioration not of the most recent but of the most primitive instinctive and emotional tendencies. Dr. Devine concluded that a vigorous intellect was not nearly as important a part of the equipment for life as a stout heart.

Dr. Crichton-Miller said that the problem before civilisation was not so much to maintain *mens sana in corpore sano* as to render the individual capable of meeting intellectual and spiritual demands which conflicted with the more primitive biological values.

Dr. H Cohen (Liverpool) showed a film illustrating the technique of air replacement in the radiological diagnosis of cerebral lesions, and discussed the diagnostic value of ventriculography and encephalography.

Sir J. Purves-Stewart also showed an interesting series of slides illustrating the results of encephalography in intracranial tumour and other conditions.

SECTION OF OPHTHALMOLOGY.

Ocular Palsies.

At a meeting of this section, with Dr. E. E. Maddox in the chair, Dr. Gordon Holmes said that few questions in neurology and ophthalmology were more difficult than the adequate analysis of an ocular palsy. Palsies might be due to lesions involving upper or lower motor neurones. A lesion of the lower motor neurone affected the muscles as such. A lesion of the upper motor neurone affected conjugate movements. The fibres of the dorsal longitudinal fasciculus connected the third, fourth, and sixth nerve nuclei. It was doubtful whether there are intercalary cells in the dorsal longitudinal fasciculus. Dr. Holmes divided palsies into three groups: (1) Paralysis of the ocular muscle due to disease of motor nerves or nuclei; (2) palsies of conjugate movements; (3) supranuclear ocular palsy.

1. Paralysis of ocular muscles due to disease of motor nerves or nuclei. Nuclear lesions were local, from hæmorrhage, tumour, or most commonly inflammatory, as in encephalitis. Wernicke's superior hæmorrhagic polio-encephalitis, often due to alcoholism, was of particular interest. Ptosis was its most common early symptom. In contrast to this acute lesion was a chronic nuclear ophthalmoplegia causing ptosis in middle life, and progressing to involve other muscles. Brain stem palsies of the intramedullary portion of the nerves were apt to involve the pyramidal tract before decussation, thus causing hemiplegia on the opposite side to the eye lesion. The ocular palsies of disseminated sclerosis were stem palsies. The paralyses of tabes might be nuclear, but were more often root palsies. The latter responded better to treatment. Compression of vessels by arterio-sclerotic vessels at the base of the brain might also occur. Any of the three ocular motor nerves might be so compressed. Rest and iodides usually cured the condition.

2. Palsies of conjugate movements did not usually cause diplopia. Lesions producing limitation of conjugate movements to one side usually lay near the sixth nucleus on that side. Dr. Holmes thought that the centre for depression and elevation of the eyes probably lay in the mid-brain.

3. Supranuclear ocular palsy usually showed inability voluntarily to move the eyes in some direction. When voluntary movements were lost in such cases the eyes *might* still be able to follow a finger reflexly.

Mr. Gayer Morgan said he was particularly interested in a group of cases superficially resembling tabes, but with a negative Wassermann reaction. Mr. Foster Moore had described non-luetic Argyll Robertson pupils in 1924. In Mr. Morgan's cases the tendon-jerks remained permanently inactive; the internal ocular paralysis of accommodation and light reaction might recover. These cases were sometimes of sudden onset. Dr. W. J. Adie had pointed out that the true Argyll Robertson *pupil* contracted briskly on convergence. In these cases the reaction to accommodation was slow and sluggish and typical of a benign condition.

Dr. Holmes in reply said most ocular movements were reflex, not mainly voluntary. He had seen a case similar to that of Mr. Maddox in which a supranuclear palsy prevented a patient looking to one side without looking down first. He thought syphilitic cases best treated by mercury and bismuth. He emphasised the preliminary fixed staring of the eyes before an oculogyral crisis. The eyes might deviate in any direction. He placed the site of lesion as probably in the corpus striatum.

Eye Symptoms in Encephalitis Lethargica.

Mr. T. H. Whittington, reading a paper on the Eye Symptoms and Sequelæ of Encephalitis Lethargica in 174 children, said the ophthalmologist found much interest in these cases. In the acute stage there were two common types: (1) "Influenza" with diplopia; (2) ocular palsies in a severe febrile illness. These acute cases often lost their ocular palsies before passing into the chronic form of encephalitis. In the chronic stage only 6 per cent. of the 174 cases had ptosis. Concomitant external strabismus was found in 15 per cent. The reaction to accommodation was affected in 47 cases, and light reaction affected in 23. Oculogyric crises occurred in six cases. These last were associated with parkinsonism. The eyes might roll up and the mouth become fixed open during a crisis, and crises might come as long as eight years after the acute illness; they were associated with emotional disturbance. Mr. Whittington suggested that these crises and symptoms might be release phenomena. The upward rollings of the eyes recalled the rolling up of the eyes in sleep and during gastro-intestinal upsets in infancy. Mr. Whittington pointed out that when hyoscine and stramonium were used in treating these cases the pupils became dilated and accommodation was paralysed. The effects could be counteracted by judicious use of pilocarpine and glasses.

Mr. D. V. Giri described a case of oculogyral crisis, and Mr. N. Bishop Harman mentioned the occurrence of ocular palsies when spinal anæsthesia was first brought into use.

Mr. Whittington in reply to a question said that he found no case of paralytic squint in his series. The only complaints of diplopia were during attempts at reading.

Shahan's Thermophore.

Dr. W. H. Crisp, of Denver, Colorado, in a paper on Shahan's Thermophore in the Treatment of Corneal Ulcers and other Eye Conditions, said that this apparatus was an efficient method of applying graduated heat to the eye. The heat was generated in an electrical resistance and conducted to the eye by a nickel-plated brass applicator. Serpiginous ulcers of the cornea responded well to treatment by the thermophore. Perfect anæsthesia by cocaine (5 per cent.), supplemented often by subconjunctival injection, was essential. The eye must be kept immobile during the application. Applications were graduated both in time and temperature. The machine could be used to provide sufficient heat to remove epibulbar growths. It was useful for troublesome small marginal chalazia.

Mr. W. CLARK SOUTER showed a series of orbital cases by lantern slides. He emphasised the frequency of orbital inflammations secondary to ethmoidal disease. He also laid stress on the importance in diagnosis of assessing accurately the secondary deviation of the eye.

SECTION OF HYDROLOGY AND CLIMATOLOGY.

THE Chairman, Dr. FORTESCUE FOX, in opening the section, said that the first part of medical hydrology, which had to do with medicinal springs, had a traditional practice in England as old as our history. The second part, which related to simple water, had opened a new chapter by the establishment of bath clinics in the towns. The third part of hydrology had to do with the sea, the greatest of mineral waters, in which terrestrial life originated. In the medical uses of the sea the British Islands, with their 6000 miles of coast, were deeply concerned. Those who practised hydrology must understand the good and bad effects of climate in the development of chronic diseases, because the operation of baths was powerfully affected by weather and climate. He believed that a whole new science of medical hydrology and climatology was being built up and that many medical men would in time devote themselves to these branches of practice. It was fitting to inaugurate this section at Eastbourne, with its typical south-eastern climate and excellent nucleus of medical baths; a town which was occupied, as the Prince of Wales had reminded them, in the national industry of turning out healthy boys and girls.

In that day's discussion on the care of

Delicate Children at the Coast

they had, he said, the advantage of the presence of a European authority from the premier (non-tuberculous) marine hospital at Wyk-auf-Föhr, where thousands of children from the German cities were given preventive and curative treatment for the various forms of delicacy which were the precursors of disease.

Dr. CARL HÄBERLIN, after referring to the earlier advocates of sea treatment, Russell and Lettsom in England and Lichtenberg and Beneke in Germany, discussed the treatment of the chronic and relapsing respiratory catarrhs from which the greater number of children sent to the sea suffer. Most of his observations were made on children sent from Hamburg. The hypersensitiveness of these children to colds and infections, he said, gradually diminishes by the sea, and in time smaller adenoid growths decrease so far as no longer to hinder breathing. Many operations on tonsils and adenoids, especially in children under six, may thus be avoided. The good results obtained in asthma Häberlin ascribes to cessation of irritation of the respiratory mucosa by dust and of the skin by over-heating, and to improvement in respiration. The continuous sea breeze stimulates even the clothed skin, and improves its function. He showed graphic records of the reactions of children under treatment. For example, the reaction to cold was investigated by small applications of ice in a number of town children newly arrived. At first the latent stage was long and the reactive redness faint. After some weeks at the sea the latent time diminished and the reactive redness increased. Another test was made by means of rectal and skin temperatures before and after cold baths. The "bad reactions," a considerable fall of temperature with slow and incomplete rise, diminished at the sea in from 50 to 28 per cent. of cases. The reaction to intracutaneous injections of tuberculin began and subsided more rapidly after treatment.

The fundamental and most characteristic effect of sea cure is not, Dr. Häberlin said, its influence on particular parts, but on the whole body. The umstimmung (toning or tuning-up of the whole body) is not a method of treatment of sick organs through direct influence on the seat of disease, but an alteration or modification of the whole body. As evidence of the stimulus to metabolism following exposure to the sea climate, he stated that in 116 children examined in conjunction with F. Müller, the heat production amounted to 2700 calories per diem on a small island, as compared with 1445 calories in a large town. It is notable that the metabolic changes and associated increase in muscular strength occur particularly during rest in the sun and air bath. The prompt improvement in appetite which occurs in 95 per cent. of children is not merely psychological (effect of change), but is due to increased metabolism and heat production, from continual stimulation of the skin. The abdominal circulation improves, chronic constipation is relieved, and the motor, secretory, and absorptive powers of the intestinal tract are increased. The increased activity of the peripheral circulation at the sea is a cardinal fact, and Fox and others have pointed out the significance of defective circulation in the skin in rheumatic cases. Children with nervous irritability are over-excited by new impressions and stimuli at the seaside; rest and limitation of time on the beach are therefore at first essential. At the Wyk Hospital much attention is given to the condition and functions of the skin. The relaxed skin is rendered tonic and active by dry rubbing, washing with cold sea water, air- and sun-baths, or by warm sea-baths, followed by cold shower-baths or sea-baths. Such applications are very brief and guarded; prolonged over-frequent sea- and sun-baths and endless paddling are deprecated as amounting almost to brutalities. As four weeks are in many cases necessary for acclimatisation, the visit to the sea should be of at least three months' duration. For more serious cases of catarrh, asthma, debility, and imperfect development, the stay should be prolonged to 6 or 12 months, or even longer. Treatment of most of the respiratory catarrhs by the sea is more important in winter than in summer.

Dr. PERCY LEWIS (Folkestone) enumerated the characteristics of the seaside climates; abundance of light, pure warm moist atmosphere, equable temperature with small variations, the presence of sea-salt in the air, and a dense atmosphere with frequent small variations of pressure. All the special features of seaside places stimulated metabolism. The abuse of marine climates—too sudden change of habits, too long exposure to sun and air, too much food, and too much excitement—were well understood at seaside schools. Delicate children at first improved during the term and relapsed in the holidays, and only after about a year returned to school without loss of weight at home. The strong stimulation of sea-bathing should only be used after acclimatisation, say one month, then only for short periods, twice or thrice a week.

Sir HENRY GAUVAIN (Alton and Hayling Island) compared the effect of open-air treatment at an inland hospital and by the sea. Children who react to this powerful stimulus do well, but for those who are not robust enough to respond, there is considerable risk. Leonard Hill and Argyll Campbell had found that the basal metabolism of children during sea-bathing was sometimes increased tenfold—a demand which strong children could meet, but the weakly required gradual acclimatisation. The following régime was adopted with success at Hayling Island hospital: (1) The children started with paddling only, the rest of the body being exposed to sun and air; (2) the body was sprayed with sea-water; (3) the children were immersed in the sea. After immersion they were given a hot drink while standing in a trough of warm water with towels round their shoulders, and then rested round a brazier. Differentiating the types which did well by the sea, Sir Henry stated that the freckling type did not respond well at the seaside. In general, he considered that for healthy individuals the stimulus of a seaside holiday produced better results in August, when the stimulating effect of the spring was wearing off, than when taken earlier in the year.

Dr. W. S. C. Copeman (London) summarised the reports received from medical officers of health and seaside practitioners on the coast in the five climatic regions: south, south-west, north-west, east, and south-east. The questionaire dealt with: (1) Particular indications in summer and winter; (2) malnutrition; (3) catarrhal conditions, indigestion, adenoids; (4) rheumatic and cardiac cases; (5) nervous instability, asthma, children from the tropics; (6) physical methods of treatment, the regulation of bathing.

Dr. H. M. Raven (Broadstairs) presented a joint medical report from the Isle of Thanet. Children with anæmia, debility, post-nasal catarrh, and chronic empyema did well all the year round, but improvement was most marked in summer. (From December to March certain cases, such as cardiac weakness, poor circulation, and rheumatism, should be treated with caution.) The available medical records from preparatory schools showed high average weight and growth. "Common colds" were not common in local open-air institutions; bronchial catarrhs cleared quickly in summer, but might persist for some weeks with little or no sputum in winter. Tonsils and adenoids were not much reduced except in minor cases. Rheumatic fever was uncommon, and the reporters state that convalescent children appeared to do better in Thanet than at some inland places. In the absence of throat infection, and if cases of minor pyrexia were isolated, acute recurrence was rare. Sea-bathing was not allowed for rheumatic cases. Sun- and air-baths are much used in open-air schools and convalescent homes, and children improve very much faster when the weather permits of this treatment, also moderate sea-bathing, excepting children with poor circulation. It is estimated that the number of bathers at Margate is 1,000,000 annually, at Broadstairs and St. Peter's 50,000.

Dr. K. R. C. Hallowes (Torquay) referred to the unexplained fact that anæmic children whose homes were by the sea improved when sent inland, just as inland children improved when sent to the sea. It would be interesting to know how far inland the iodine content of the sea air prevailed.

A RESOLUTION.

On the motion of the Chairman, seconded by Dr. Percy Lewis, a resolution was passed recommending that "in view of the increasing use of the climatic advantages and bathing facilities of the British marine resorts and of their great therapeutic value, both for children and adults, in the prevention and cure of disease, a medical organisation be formed to promote the scientific development of these forms of treatment in the British Islands."

REVIEWS AND NOTICES OF BOOKS

Injuries and Sport.

A General Guide for the Practitioner. By C. B. Heald, M.D., M.R.C.P., Physician with charge of Electrotherapeutic Department, Royal Free Hospital. London: Humphrey Milford, Oxford University Press. 1931. Pp. 543. 25s.

The title of this book is unfair to its scope. Bodily injuries are not, in this country at least, primarily associated with sport, and it may be doubted whether the injuries sustained as a result of sports differ in any essential way from other injuries. The book is not designed only for those whose duties are especially connected with the playing-fields or race-tracks, but will be read with interest by all practitioners. The early chapters contain the chief material upon which the book's claim to originality is based—the analysis of the processes of repair and the advocacy of electrotherapy. Dr. Heald believes repair to be effected by primitive, that is, undifferentiated, cells exuding from the blood, which later acquire the power of becoming differentiated into adult cells, just as the primitive cells of the ovum become differentiated in the process of embryonic growth, under the influence especially of their environment. The author's enthusiasm for electrotherapy is evidently based on a considerable experience. He describes and illustrates the more orthodox methods of treatment by splinting and immobilisation, but lays great stress on the value of anodal galvanism in relieving pain and in diminishing swelling due to effusion and muscular spasm. The general practitioner, to whom the work is addressed, is not at present in a position to be a dispassionate judge of electrical methods, but he is generally eager to try out new measures which are said to be beneficial in cases of injury. The short chapter on massage (physiotherapeutics) reflects a more general verdict. Neither in this section nor in that on electrotherapeutics is there any reference to the possible exclusion of children from these methods of treatment.

The book appears to be a very complete, though necessarily condensed, account of injuries and their treatment. The second and more extended part deals with specific injuries of bony and soft tissues in different parts of the body, and is summarised in a long appendix, which can be used as an emergency reference-table in diagnosis and treatment. The book has 380 illustrations, and on the fly-leaves will be found a diagrammatic index for both bony and soft-tissue injuries.

The study of this work will undoubtedly enlarge both the general outlook and practical efficiency of the practitioner in regard to injuries which sometimes cause him more worry than any other group of cases; the possibility of unusual complications, easily overlooked during attention to other surgical detail, is not ignored by Dr. Heald. After the practitioner has dealt with an emergency he will do well to ascertain from this book, with the help of the curious but useful index, in what ways he may be able to protect his patient from future disability.

Diagnosis and Treatment of Venereal Diseases in General Practice.

Fourth edition. By L. W. HARRISON, D.S.O., F.R.C.P.E., Director of Venereal Diseases Department, St. Thomas's Hospital. London: Humphrey Milford, Oxford University Press. 1931. Pp. 567. 25*s.*

THERE is sufficient new information in this book to make it worth buying even by those who have the third edition. The section on treatment of syphilis has been almost wholly rewritten, and care has been taken to emphasise indications for and against special preparations and their dosages at different stages of the disease. Every possible complication of arsenobenzol therapy is dealt with and the Abelin test of the brothers Lloyd is described, as a guide to the prevention of dermatitis and jaundice during 914 administration. The latest theory of E. B. Craven, Jr. (Johns Hopkins Bulletin, 1931), is added on a special slip facing page 378, stating the type of diet considered most likely to prevent jaundice during treatment. Full details of treatment for each stage of syphilis are given, and Colonel Harrison emphasises especially the danger of under-treatment. The one section in which more detailed instruction might be acceptable to the practitioner is that on treatment of the pregnant woman. The section on gonorrhœa and its treatment is sound both from the surgical and the psychological points of view. All usual complications of the disease are described and appropriate treatment is recommended. Vaccine therapy is fully discussed; in Colonel Harrison's view the recently produced vaccine of L. Dimond has so far proved by far the most valuable on the market. Non-venereal lesions which are liable to be mistaken for venereal conditions are described and illustrated by excellent plates. Dr. F. G. Crookshank has contributed an account, extending over 50 pages, of the medico-legal aspects of venereal disease, and admirable appendices give, in brief, descriptions of the Wassermann tests and of the various flocculation tests in common use; Lange's gold test is also described. The illustrations are good, some of the colour prints being particularly helpful.

Colonel Harrison's book should be of value not only to the general practitioner but also to the physician who sees in his wards the later visceral and nervous manifestations of syphilis, and whose knowledge of modern medication and dosage sometimes lags behind his clinical and diagnostic ability.

Farmacologia de la Digital.

By A. GAMIR. Madrid: Editorial Paracelso. 1931. Pp. 308. 7 pesetas.

THIS book is intended to provide Spanish pharmacists and doctors with a comprehensive survey of the main facts concerning digitalis purpurea. The author begins with a historical account of the plant from its first description by botanists up to the most recent attempts to elucidate its chemistry, and goes on to describe the botanical characters of digitalis, the various methods of cultivation, collection, preservation, and preparation of the leaves, and the means of identifying the pure drug and of recognising adulterations. A chapter is devoted to a discussion of its many official, non-official, and patented preparations, and a clear account is given of the chemical composition of its active principles. Of special interest to the medical man are the chapters devoted to an analysis of the action and uses of the drug, the methods of assaying its active principles, and the dosage when given by various routes. The book ends with an account of the toxicology of digitalis, and gives a number of reactions by which its presence can be recognised. It is a well-compiled and useful monograph.

The Doctor's Second Thoughts.

By Sir JAMES CRICHTON-BROWNE. London: Ernest Benn, Ltd. 1931. Pp. 294. 7*s.* 6*d.*

Sir James Crichton-Browne's successful book, "What the Doctor Thought," has here a sequel equally readable. In his long and distinguished career as a physician and mental specialist, Sir James has met many notable people, had many curious experiences, and maintained a keen interest in the scientific and literary aspects of the passing show. This collection of his notes made at the end of his day's work is, as was its predecessor, chatty and informative.

Unorthodox Reminiscences.

By Sir GEORGE TURNER, K.B.E., C.B., F.R.C.S. London: John Murray. 1931. Pp. 344. 15*s.*

Sir George Turner's autobiographical record is not one which would be anticipated from the consulting surgeon of a teaching hospital, and of this the reader will be warned by the title. The author makes little reference to surgery, as an art or science, save where allusions are pertinent to the running commentary of a man of the world upon the happenings of a life which professionally was medical and socially cosmopolitan. A description of a public school in the seventies brings vividly to mind the changes which 60 years have brought about in education—bringing-up, that is, and not tuition particularly—at those essentially national institutions; and some of what Sir George has to say of Uppingham will surprise his audience. But in essentials these examples of autocratic rule remain the same, and it is probable that if Sir George (like Mr. Bultitude) returned to his old school he would to-day incur the same credit and the same penalties for his independence as befell him more than 50 years ago.

A life-long connexion with St. George's Hospital, as student, teacher, and staff-officer, yields good material for reminiscence. The institution is dealt with according to the desultory scheme of the book. Very little is said of hospital administration, or the routine of education in lecture-room or ward; but there are neat portraits, kind and caustic, of various members of the staff; considerable tribute is paid to old hospital servants, and some of the stories illustrate aptly byegone times.

A large number of persons, distinguished in general society or in scientific circles, pass through these discursive pages as friends, travelling companions, and acquaintances of the author, and one chapter contains a sketch of G. J. Romanes of particular interest. Chapters dealing with queer coincidences, odd legal cases, and theatrical celebrities, and other chapters entitled, disarmingly, "A mixed bag" and "Pot-pourri," will repay reading for their anecdotes.

Sir George's love of racing was acquired in his cradle and found its practical expression while he was still at Uppingham. He is the reverse of ashamed of his successes at the ring-side, and it is easy to see that for him the pageant of the race-course and the heterogeneous attendance were the real attractions.

During the war Sir George Turner served with the Navy, with the rank of rear-admiral, and his connexion with the Service leads him to comment on the absence of surgical specialism directed to the needs of the blue-jacket. He outlines a scheme for the appointment of junior specialists from the large general hospitals as Aides to the Naval Medical Service. He would pay these surgeons a small retaining fee, and they could be summoned for special operations from the big towns nearest to the naval hospital where their intervention was needed. Sir George points to the fact that healthy young sailors do not form a large clinical field for special surgery, and that specialists deserving the title are the product of practice in crowded centres.

The book contains reflections upon many circumstances and situations where opinions are divided. Sir George Turner makes no concealment of his views, and would be surprised to find them acceptable to all. Indeed, it is easy to see that he enjoys to face opposition, a quality that gives entertainment to his unorthodox memories.

Journal of Pathology and Bacteriology.

THE following appear in the issue for July, 1931 (vol. xxxiv., No. 4, pp. 401–596).—A simple, delicate, and rapid method of detecting the formation of acetylmeythylcarbinol by bacteria fermenting carbohydrate, by R. A. Q. O'Meara (Dublin). An improved technique for the Voges-Proskauer reaction, using a simple culture fluid with sodium fumarate and testing with creatine and caustic soda.—Auto-hæmagglutination, by W. Boxwell and J. W. Bigger (Dublin). A clear and convincing example of this rare condition, in which the patient's serum agglutinated her own or any other human red corpuscles at room temperature.—Acetaldehyde as a fixative for neuroglia, by J. Gough (Cardiff). Followed by silver impregnation.—Mitochondrial changes in experimental oxalate and manium nephritis, by J. Gough (Cardiff). Mitochondrial changes are perceptible after an hour or two, and do not necessarily indicate irreparable damage.—The classification of Monilias by serological methods, by K. Stone and L. P. Garrod (London). By complement-fixation and precipitation tests all cultures obtained from cases of thrush were identical, and the majority of those derived from various pathological lesions belonged to the same group.—Compression fracture of the fourth lumbar vertebra of a calf, by T. Hare (London).—The action of Congo red on streptococcal hæmolysin and on *B. welchii* hæmolysin, by J. Gordon (Leeds). Congo red neutralises these hæmolysins, and the action is reversible; it does not neutralise saponin or bile salts.—Malignant phæochromocytoma of the adrenals, by E. S. J. King (Melbourne). Bilateral solid tumours of the adrenal medulla with secondaries in liver, lungs, bowels, bones, &c.; the cells relatively well differentiated, and many giving the chrome reaction.—An epizoötic produced by a hæmolytic streptococcus in laboratory guinea-pigs with abscess formation, by W. W. Beattie (Montreal). Acute and chronic lesions caused by an organism indistinguishable from *S. pyogenes*.—Further observations on testicular extract and its effect upon tissue permeability, by D. McClean (London). The author has failed to identify or isolate the substance in extracts of testis, which has such a remarkable effect on the dispersion of particulate emulsions injected into the skin and on the taking of vaccinia virus.—The interactions of staphylococcus toxin anatoxin and antitoxin, by F. M. Burnet (Melbourne). A thorough and scholarly study of staphylococcus toxin, the modification produced by treatment with formalin, and the neutralising antitoxin, which seems likely to be of practical value.—Lesions of the adrenal glands of rabbits caused by infection with herpes virus, by W. Smith (London). Some strains of virus produced a generalised infection after inoculation into the skin.—A new series of graded collodion membranes suitable for general bacteriological use, especially in filtrable virus studies, by W. J. Elford (London). Technical details of a complex procedure.—A strain of *Bact. ærtrycke*, with unusual epidemic characters, by W. W. C. Topley, M. Greenwood, and J. Wilson (London). Produces a widespread infection of a mouse population without causing a severe and fatal epidemic, and so results in a considerable degree of protection.—A new serological type of Salmonella, by P. H. Leslie and A. G. Shera (Oxford and Eastbourne). Isolated from a clinical example of paratyphoid fever.—The preparation of fractions of different antitoxic quality from the same serum, by M. Barr and A. T. Glenny (Beckenham). Successive fractionation with ammonium sulphate gives a series of antitoxic globulins with widely different in vitro/in vivo ratios.—Enzoötic hepatitis or Rift Valley Fever: an undescribed virus disease of sheep, cattle, and man from East Africa, by R. Daubney, J. R. Hudson, and P. C. Garnham (Kenya).—The chemotherapy of experimental streptococcus infections, by C. H. Browning, J. B. Cohen, S. Ellingworth, and R. Gulbransen (Glasgow and Leeds). Some anil quinolines have a decided effect in preventing and curing streptococcal infections in mice.—Staphylococcus toxin and antitoxin, by H. J. Parish and W. Clark (Beckenham). The reality of the toxin and the efficacy of the antitoxin are confirmed.—Further notes on Paget's disease of the nipple, by R. Muir (Glasgow). The condition is caused by the invasion of the epidermis by a carcinoma arising in the ducts or alveoli of the heart.—A new method of applying Nile blue as a fat stain, by T. Rettie (Edinburgh).—Obituary notices of C. Powell White (portrait) and John Anderson. Proceedings of the Society.

IN the issue of September, 1931 (vol. xxxiv., No. 5, pp. 597–700) W. Bulloch (London) gives a very interesting account, with a striking portrait of Shibasaburo, Baron Kitasato, the first Japanese bacteriologist, his devotion to Koch, his discovery with Behring of antitoxin, his identification of the plague bacillus, and his influence for good in his country.—Experimental renal disease produced by X ray, by M. S. S. Earlam and A. Bolliger (Sydney). Unilateral renal lesions produced by single exposures to X rays of medium wave-length consist of acute degeneration of the convoluted tubules; this is followed by scarring and some regeneration. X ray nephritis when well established is characterised by nitrogen retention, hypercholesterolæmia, polyuria, uræmia, and œdemia. A thorough anatomical and functional study which should be read in detail.—Primary cancer of the thymus with pluriglandular disturbance, by O. Leyton, H. M. Turnbull, and A. B. Bratton (London). A boy of 11 became fat and hairy; a man of 31 showed increasing fatness of the face, neck, and trunk. Both had diabetes mellitus, and at necropsy showed a small-celled medullary carcinoma of thymus with hypertrophy of the suprarenal cortex, functional hypertrophy of the thyroid, and fatty livers.—A further contribution to the knowledge of innervation of human tumours, by H. Oerte, H. Nye, and B. Thomlinson (Montreal). Affirms their previous conclusion that tumours really have nerves of their own (see p. 646).—On the existence of two forms of diphtheria bacillus —*B. diphtheriæ gravis* and *B. diphtheriæ mitis*—and a new medium for their differentiation and for the bacteriological diagnosis of diphtheria, by J. S. Anderson, F. C. Happold, J. W. McLeod, and J. G. Thomson (Leeds).—Obituary notices of J. Lorraine Smith (portrait), G. McCallum, and A. T. MacConkey (portrait).

THE LANCET.

LONDON: SATURDAY, SEPTEMBER 19, 1931.

STRAITENED HOUSEKEEPING.

THE axe has fallen on medicine, in the first instance on the obedient necks of the 15,750 doctors in insurance practice who forgo on the average just under £50 each. On behalf of this group of practitioners the deputy medical secretary of the British Medical Association has intimated to Government health departments that they are prepared to bear their fair share of the burden which the community generally will be called upon to shoulder. This implies the acceptance of the reduction of the capitation rate by one shilling, as recommended by the May Committee, but not of the grounds on which this committee justified the reduction. The MINISTER OF HEALTH has stated in effect that the proposal for a percentage reduction is not based upon any doubt whether the present capitation fee is a just payment for services rendered; the grounds upon which it was based in 1924 remain unchallenged, and it is open to the Insurance Acts Committee to suggest its reconsideration at any time considered expedient. Rural practitioners will of course suffer more than urban ones from the increased duty on motor spirit, but they will not be subjected to reduction in the mileage grant. Representatives of the I.A.C. were assured that there would be corresponding sacrifice on the part of other bodies or persons concerned in the administration of national health insurance. Salaries in the public health services are not directly affected by this decision, but the MINISTER OF HEALTH in his circular dated Sept. 21st has intimated to local sanitary authorities that they should give all their officers the opportunity of sharing equitably in the sacrifice demanded by the national need, a euphemism which these authorities will not be slow to translate. They have it is true for the most part entered into binding agreement that certain scales of medical salaries would be maintained for five years from 1929, and if the present medical staffs do not ask to be regarded as a privileged group of local government officials, they are at all events entitled to expect uniform treatment over the whole country.

The public health doctor is likely to forget his personal sacrifice in his fear that social services may be imperilled through the cutting down of other expenditure by local authorities. He will be relieved that the circular, to which allusion has been made above, contains a sharply worded warning against any wholesale and ill-considered course of cutting down expenditure whatever its nature or purpose may be, though it enjoins the utmost care in making charges on the local rates, since the ratepayer and taxpayer are largely the same people. In making a survey of its expenditure the local authority is asked to pay special regard to whether the service is required on urgent grounds of public health. No one will quarrel with wise economy in administration and the strict supervision of every detail of expenditure, for as one of our correspondents remarks (p. 649), it is possible for big public departments to be grossly extravagant in small items, the cumulative effect of which is considerable. Some of our medical officers may positively enjoy the task of achieving efficiency in public health measures, for there are still many obsolete practices in high places, excused on the ground that public faith may not survive the scrapping of measures formerly enjoined. It may indeed be long since water-carts in London sprayed dilute permanganate on the streets, but routine house disinfection is a relic of epidemiological theory which we have long grown out of. It may be something of a fearful joy for the medical officer to be compelled by economy to discard such incubuses. Institutional life is proverbially uneconomical. It can of course never emulate the value which a canny and imaginative housewife with a growing family gets out of a minimal income, but here again there will be positive satisfaction in tightening up slackness. Another of our correspondents indicates some of the places where detailed saving can be effected without loss of efficiency. Many of the feeble old people in our public assistance institutions would get along well enough at home with a little extra assistance and oversight unless removed by the zealous official, and the same applies to many forms of chronic illness for which the constant attention of a skilled staff is not needed. This would release beds for hospital cases which would otherwise have to be provided at a large capital expenditure. In fever hospitals beds are too largely occupied in isolating mild cases of scarlet fever long after medicine has become aware that their isolation is powerless to affect the prevalence of disease in the community. Only a tithe of the money so saved would be required to put into effect the principles of preventive immunisation which are already achieving so much in the more enlightened communities.

We may not hope that the lean years will pass without the call for further sacrifice. Capital expenditure on repairs and renewals, if too long delayed, may assume large proportions and render impossible developments of the health service which showed great promise last year. It may require rigid determination to maintain what has already been achieved. And for this the coöperation of an intelligent public will be invaluable. Instruction in public health must go on, and with better times the full activities can be resumed, probably with better outcome as the reward of hard-won discrimination.

EPIDEMIC RABIES IN MAN.

THE last twenty years have been remarkable for the appearance, either for the first time or in forms of enhanced virulence, of diseases due to filtrable viruses, and especially those with a predilection for the nervous system. The outbreak and world-wide dissemination of epidemic encephalitis lethargica was followed only a few years later by the occurrence of large numbers of cases of post-vaccinal encephalitis, of encephalitis complicating measles, and of acute disseminated encephalitis of unknown origin. Resemblances were observed between the three last-named forms of encephalitis and the "neuroparalytic accidents" which had for many years been known to complicate the Pasteur treatment of rabies in man. In this issue Dr. E. Weston Hurst and Dr. J. L. Pawan report an epidemic of acute ascending myelitis which occurred in 1929 in the island of Trinidad, and which there is reason to believe was due to the virus of rabies. Seventeen natives, including members both of the East Indian and of the Negro races, were affected. The clinical picture was that of ascending paralysis, with loss of sphincter control, terminating fatally through paralysis of respiration. The pathological changes in the spinal cord were characteristic of rabies, though no Negri bodies were found. The disease proved transmissible to animals which exhibited both the symptoms of rabies and the characteristic pathological changes of this disease, including the presence of Negri bodies. A similar virus has been isolated from cattle in Trinidad. No direct mode of transmission from the cattle to the affected individuals has been discovered, nor was there evidence that they had been bitten by dogs. It is tentatively suggested that the disease has been conveyed from the cattle to man by the blood-sucking vampire bat, indigenous to Trinidad.

Ascending paralysis without mental excitement and pharyngeal spasm has long been recognised as a rare manifestation of human infection with rabies, and is the characteristic form of the disease in some animals, especially the bovidæ. An epidemic of this form of rabies in man has not previously been described, though R. Kobayshi[1] isolated a virus resembling that of rabies from a sufferer in an epidemic of encephalitis in Japan in 1924. There is some doubt, however, as to whether this virus should be held responsible for the epidemic. R. E. Knutti[2] has recently reported a case of myelitis in man, which he proved to be due to the virus of rabies, and in which the mode of infection could not be traced. The possibility of rabies infection must therefore always be considered in obscure cases of ascending myelitis or Landry's paralysis, even when there is no history of contact with a rabid animal.

As in the case of acute disseminated encephalitis complicating the exanthemata, controversy has arisen as to whether the "neuroparalytic accidents" which occur in the course of the prophylactic treatment of rabies should be regarded as due to rabies virus, or to some toxin injected with the vaccine, or to a previously latent neurotropic infection. Hurst and Pawan apparently reject the view that rabies is the cause, for they state that the "cases of paralytic rabies arising during or after antirabic treatment must be sharply differentiated from those of the so-called paralytic accidents in which the lesions, quite different from those of rabies, are identical with those in post-vaccinal encephalitis." It is doubtful, however, whether upon clinical grounds cases of acute ascending paralysis occurring during treatment for rabies can be sharply distinguished from acute transverse myelitis arising in similar circumstances. In both cases the period of incubation is shorter than that of rabies itself. Whether the pathological differences justify the assumption of a difference in ætiology may be doubted, especially as in Knutti's case both the white and the grey matter of the cord were extensively destroyed. P. Bassoe and R. R. Grinker,[3] who have lately compared the pathological changes in human rabies with those in rabies vaccine encephalomyelitis, point out that in many ways the rabies vaccine is analogous to vaccinia. They suggest that in both cases the encephalomyelitis which may follow the vaccination owes its peculiar pathological features to the fact that it is caused by an attenuated virus.

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IRREGULARITIES OF THE TEETH AND JAW.

Although Fauchard, in the eighteenth century, wrote about irregularities of the teeth and devised some simple forms of appliance for their treatment, yet the first contribution of importance to orthodontics was the book on oral deformities written by Norman Kingsley in 1879. Eight years later, with the publication of E. H. Angle's famous book on "Malocclusion of the Teeth," the science of modern orthodontics was definitely launched, for Angle provided it with a classification and a technique which, in a modified form, have remained an integral part of its teaching. Up to now the greatest advances in the subject have been along the lines of technique, for a succession of ingenious mechanical appliances of great delicacy have been devised for the purpose of moving misplaced teeth into correct alignment. Our knowledge of ætiology has been relatively scanty, though a mass of literature has been accumulated on the subject.

The latest contribution[4] is a volume by Prof. J. B. Brash, amplified from a series of four lectures delivered under the auspices of the Dental Board. Prof. Brash's previous work on the growth of the jaws, normal and abnormal, details original research. This volume represents a critical stock-taking of the extent of our knowledge of the causation of malocclusion, and shows discernment, as well as breadth of knowledge. We imagine that it will be long before it is superseded.

Many different theories have been propounded on the cause of irregular teeth; for no one theory could explain all forms of malocclusion, and the types of irregularity are numerous and varied. Certain well-recognised forms of irregularity seemed to have an obvious explanation. For example, the crowding of the premolars is attributed to premature loss of the milk molars, the separation of the upper incisors to a persistent frænum or to the presence of a supernumerary tooth, the gap between the upper and lower incisors to thumb-sucking. But these irregularities, though they may lead to impairment of function and facial disfigurement, are of minor importance. The gross forms of malocclusion, in which the whole of the dental arches are involved, are more puzzling. Certain constantly recurring types of malocclusion tend to fall into three groups: (1) generalised crowding, usually affecting both jaws, and characterised by narrow arches, high palate, and prominent incisors; (2) defective development of the mandible, accompanied by a receding chin and a prominence of the upper front teeth, which appears greater than it is because of the retrusion of the lower incisors; and (3) the underhung lower jaw, in which the lower incisors project beyond the upper teeth. These main types of malocclusion, which are serious both æsthetically and functionally, have given rise to much controversy. In the early days of orthodontics, attempts to explain irregularities of the teeth in terms of mechanical factors were common. Even such varieties as superior protrusion and inferior retrusion were attributed to local factors operating in childhood. Gradually it was realised that such explanations were unsound, and that while certain limited and sharply defined types of irregularity might be due to a mechanical factor, some other explanation must be sought for the more serious forms of malocclusion. The next stage in the history of orthodontics was the ascription of malocclusion to exogenous and environmental factors, such as adenoids and mouth-breathing, bottle-feeding, and rickets. For long the association between adenoids and both superior protrusion and mandibular retrusion was accepted by many authorities. Explanation of the genesis of contracted arches was simple and plausible. The pressure of the cheeks in mouth-breathing and the absence of the moulding action of the tongue, which should lie against the palate in nasal respiration, were factors which, according to this view, combined to push up the palate and buckle the nasal septum and so compress the dental arch. Unfortunately, this facile theory was found less acceptable as knowledge increased. M. H. CRYER showed that there was no constant relation between the palate and nasal septum, and that a broad arch could be associated with a deflected septum and vice versa. More recently, Prof. BRASH observed that the level of the palate descends as growth occurs, and that the high palate associated with contracted arches is due to an abnormal growth of the alveolar processes. This observation did much to cast doubt on the validity of the hypothesis that adenoids and mouth-breathing are the most important factors in malocclusion. Prof. BRASH concludes from a review of the evidence that "it has still to be proved that there is any significant correlation between the presence of adenoids and the incidence of deformities of the jaws and palate."

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[1] Japan Med. World, 1925, v., 145.

[2] Jour. Amer. Med. Assoc., 1929, xciii., 754.

[3] Arch. Neur. and Psychiat., 1930, xxiii., 1183.

[4] The Ætiology of Irregularity and Malocclusion of the Teeth. By Prof. J. B. Brash, M.A., M.D. London: The Dental Board of the United Kingdom. 1931. 5s.

The more recent developments in orthodontic science have been in the direction of exploring the rôle of exogenous factors in malocclusion, such as heredity and disorders of growth. It is significant that whereas 20 years ago attention was chiefly focused on the permanent teeth, and the possibility of malocclusion in the milk dentition was passed over as both rare and unimportant, now the orthodontist devotes an increasing amount of attention to the milk dentition. A closer study has shown that malocclusion is common in this dentition, and therefore that the factors concerned in irregularities of the teeth must commence in early life. More recently attention has been paid to the possibility that deformities of the jaws are established during fœtal life. B. WEINBURGER, M. SCHWARZ, and others have shown that the condition of mandibular retrusion may be present at birth. The study of the inheritance of jaw forms and malocclusion has become imperative, and it seems likely to shed much light on the ætiology of malocclusion. Sir ARTHUR KEITH has established a strong case for the view that evolutionary tendencies of comparatively recent origin are tending to bring about profound changes in the shapes of the jaws and that some forms of malocclusion represent a disharmony in evolution. Prof. BRASH arrives at the conclusion that while there are "accidental" happenings to the jaws such as habits, mechanical factors, or recognisable pathological conditions, the explanation of malocclusion in general must be sought in inheritance, and that environment, though not negligible, is a complemental factor. The narrow attitude which looked upon irregularities of the teeth as a local condition with a local cause is thus being abandoned in favour of the view that the ætiology of malocclusion is part of a large problem which can only be solved on biological lines.

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THE BRITISH ASSOCIATION.

As already announced in our columns, the centenary meeting of the British Association for the Advancement of Science will be held in London from Sept. 23rd to 30th. The installation of Lieut.-General J. C. Smuts, F.R.S., as president will take place next Wednesday at 3 P.M. in the Albert Hall, and at 9 P.M. on the same evening, at the Central Hall, Westminster, he will deliver his presidential address on the Scientific World-Picture of To-day. The meeting coincides with the celebrations commemorating the centenary of Michael Faraday, who, on August 29th, 1831, made the discovery of electro-magnetic induction. Delegates will be received at the Royal Institution in the afternoon of Sept. 21st and a meeting will be held in the same evening at Queen's Hall, when addresses on Faraday's work will be given by the Prime Minister, the duc de Broglie, Marchese Marconi, Prof. Elihu Thomson, Prof. P. Zeeman, Prof. P. Debye, Lord Rutherford, Sir William Bragg, and Lord Eustace Percy. On Sept. 23rd, a Faraday exhibition, organised at the Albert Hall by the Institution of Electrical Engineers, will be opened to the public. Special exhibits will demonstrate the full development of electrical and chemical science and industry which have their origin in Faraday's work.

ANNOTATIONS

DIFFICULTIES IN CERTIFYING MENTAL DEFICIENCY.

Part V. of the Education Act makes it the duty of the parent of a defective child to cause the child to attend a special school where one is available. The local education authority, if satisfied that the parent is not making suitable provision for the child's education, may require the parent to send the child to a suitable school. "If he fails without reasonable excuse to do so," the local authority may apply for a magistrate's order. The first question, of course, is whether the child is defective, not merely "dull or backward," to quote Section 55 of the Act, but "by reason of mental or physical defect incapable of receiving proper benefit from the instruction in the ordinary public elementary schools." A recent case, before the Taunton magistrates, failed because the medical witness could not agree upon the question whether the child was defective or not. The child was a girl of 13. The school medical officer for the borough (Dr. J. Allen) gave evidence that she was at least three years below the usual standard for her age. After an adjournment, apparently arranged in order to obtain further medical evidence, Dr. H. T. Aveline, superintendent of the Mental Hospital at Cotford, gave evidence that the girl read and wrote from dictation quite well, could calculate change satisfactorily, and was able to tell the time. He found her decidedly backward and dull in her answers to certain intelligence tests, and he thought her about a year behind her age; but he did not consider her certifiable as a feeble-minded person. He thought her capable of receiving benefit from the instruction in the ordinary public elementary school. Section 55 of the Act seems to require that such a child should be capable not only of receiving "benefit" but of receiving "proper benefit" in an elementary school. However that may be, the magistrates declined to order her to be sent to the Sandhill Park Institution at Bishop's Lydeard and dismissed the local authority's application with costs.

It is unfortunate when such proceedings are brought unsuccessfully. The refusal of such an application tends to encourage parents of other backward children in their very natural reluctance to send a child from home to a special institution. It is particularly unfortunate when the failure of the proceedings is due to diversity of medical evidence. Whether or not the variance was due to the fact that the superintendent of a mental hospital approaches a case from a slightly different angle from that of a school medical officer, it is a pity that medical standards of mental deficiency should be capable of representation as merely personal. Possibly consultation between medical witnesses would save the local authority from taking fruitless action or alternatively would enable the question of the child's deficiency to be referred to the Board of Education as may be done "in case of doubt" under Section 55 subsection (6) of the Act. Children suitable for special school education are usually certified before the age of 13; but there appear to have been special circumstances in the Taunton case, for it was stated that the girl had originally been certified by the county medical officer. Certification for purely educational purposes may some day be abolished if the recommendations of the Wood Report receive effect. The Taunton case will perhaps bring the day nearer.

STIFF JOINTS.

THE need to distinguish clearly between stiffness and true ankylosis before attempting to improve the mobility of a joint, or assessing disability, is emphasised by Dr. Laquerrière, Dr. Loubier, and Dr. Jaudel in a communication to the May-June issue of the *Revue d'Actinologie et de Physiothérapie.*[1] In true ankylosis the articular ends are united by bone or fibrous tissue, and these cases are outside the scope of physiotherapy. In cases of false ankylosis, or joint stiffness, as the authors prefer to call them, X ray examination shows the absence of bony union and the presence of a joint cavity. The stiffness may be due to a variety of causes, which must be investigated, but even after the condition has been correctly diagnosed the degree of improvement which may be expected to follow on a course of physiotherapy cannot be predicted. The authors' experience, that apparently similar conditions show marked differences in their reaction to physical treatment, accords with that of other observers. When the articular ends of the bones have undergone definite changes in shape, the possibility of effecting some improvement in function must be considered; the presence of a bony mass may frustrate any attempt to improve the usefulness of the joint by physiotherapy. In cases of joint stiffness following injury, when X ray examination is negative, thickening of the tissues surrounding the joint may sometimes be recognised on palpation. This thickening is at first due to œdema and congestion of tissues in the early stages of repair, and later to the development of fibrous tissue. In neglected cases, contraction of joint-capsule and ligaments, adhesions of tendons, atrophy of muscles, and, in old-standing cases, decalcification of the bone and atrophic changes in the cartilage, have destroyed the functional capacity of the joint. In their early stages extra-articular lesions respond favourably to physiotherapy; later, prolonged treatment may give some functional improvement. A pseudo-stiffness due to intra- or extra-articular causes of pain on movement must be recognised. It may be due to an inflammatory process or to the presence of loose bodies and fringes. In cases of stiffness due to cicatricial contractions of soft parts, where destruction of the tissues was not too extensive, the authors have recorded satisfactory results from radiotherapy and ionisation. The use of the constant current is recommended in the treatment of stiff joints because of its properties of allaying pain, improving the blood-supply, and diminishing œdema and vascular stasis. These authors claim for it also a trophic action and a mild fibrolytic action, which they attribute to the liberation of sodium ions in the tissues. Ionisation has given good results in their hands; iodine and salicylic ions are most frequently employed. Local ultra-violet irradiations are recommended for the improvement of tissue nutrition, and infra-red radiations as sedatives. Faradic stimulation and diathermy are also recommended.

Many of the cases reported by Dr. Laquerrière and his colleagues were first seen weeks, or even months, after the primary injury to the joint, at a time when the most profitable stage for physical treatment had passed. This neglect is not altogether unknown in this country, but fortunately most practitioners are beginning to realise that it is in the period immediately following the injury that the functional value of a joint should be safeguarded by adequate treatment. It is becoming more widely known also that the final disability does not depend entirely on the severity of the initial lesion. A momentary, or even an incomplete, separation of the parts of a joint involving tears in the capsule and ligament, and separation or tearing of the cartilage, is no longer regarded as a trivial injury. Rest, under conditions approaching most closely to the physiological requirements of the tissues, and approximation of the lacerated structures during the early stages of repair are now considered essential for the attainment of good functional results. Splinting, massage, active movements, electrotherapy and irradiation, all play their part in the attempt to establish the ideal conditions for repair. Rest, in the early stages of repair, inhibits the formation of excessive fibrous tissue and lessens the risk of the development of bone in the tissues surrounding the injured joint. Electrotherapy is directed in the early stages towards allaying pain, clearing up œdema, assisting the blood-flow, and warming the tissues. Massage, if it is gentle and superficial, relieves spasm. Subsequent treatment involves the maintenance of favourable local conditions of warmth and good blood-supply, and the encouragement of active movements designed gradually to increase the tone of the muscles, until ultimately full resumption of free voluntary movement is attained.

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[1] Revue d'Actinologie et de Physiothérapie, 1931, vii., 306.

VITAMIN D IN IRRADIATED YEAST.

It is now pretty generally recognised that infants and young children, in temperate latitudes throughout the world, need routine antirachitic treatment at any rate in the winter; the incidence of rickets, even among breast-fed babies, is not negligible. In some ways, as A. F. Hess points out, modern science has provided us with an embarrassing richness of therapeutic materials for the purpose and there is also a very wide choice of means of administering vitamin D to the child. Shall we treat the human mother, or the cow from which the artificially fed baby gets its milk, or shall we treat the baby itself, and when we have decided this point, shall we use ultra-violet irradiation or shall we administer cod-liver oil or its unsaponifiable fraction, or irradiated ergosterol, or irradiated milk or irradiated yeast or any other irradiated material? If it is decided to administer the therapy to the human mother or to the cow, rather than to the infant, the fact must not be lost sight of that the mother herself may require the vitamin, and her body may in that case not pass it on to the child. Such therapy through the mother should not be relied on blindly; the milk should be tested biologically in order that one may be quite sure that the desired supplement really reaches the baby. In choosing the means of providing the vitamin to mother or child a number of points have to be considered, beyond the simple one of the antirachitic potency of the means chosen. There are questions of cheapness, of convenience, of palatability, and of possible toxicity; there is also the problem how best to obtain the mother's coöperation, or how to obviate the need of relying on it. The preparation and testing of an antirachitic material which meets most of the important requirements was described in our last issue by Mr. S. K. Kon, Ph.D. who has prepared dried yeast and rendered it potently antirachitic by irradiation with ultraviolet light. Tested on rats this irradiated yeast was found to cure rickets in a very small daily dose, while it retained its antirachitic potency for many months in a refrigerator or exposed to air at room temperature. It was found to be toxic for rats in an enormous dose, 15,000 times the minimal curative dose. A trial of it was made on rachitic infants in Warsaw[1] when a daily dose of 0·75 g. was found sufficient to cure rickets in babies. Hess[2] made trial of the milk of cows fed with a supplement of irradiated yeast; rickets was both prevented and cured in babies who consumed such milk. The above tests seem to show that irradiated yeast can provide a material which satisfies every requirement. It is cheap and convenient; it is not particularly palatable, but the dose needed is so small that the flavour can easily be disguised. If its use as a supplement to the diet of cows supplying nursery milk were made compulsory there would no longer be any question of the mother's coöperation being needed save in the purchasing of the right milk. Irradiated yeast is, however, at one disadvantage; it does not convey vitamin A together with its vitamin D, and every material which fails in this point must be ranked as inferior dietetically to cod-liver oil.

IRISH HOSPITALS AND TRAFFIC CASUALTIES.

While many provisions of the Irish Free State's proposed Road Traffic Bill resemble the Road Traffic Act passed at Westminster last year, Clause 156 contains interesting variations as to the reimbursement of hospitals. If the proposal becomes law, a hospital in the Free State will have an independent right of action against a negligent motorist to recover the expense of treatment of a victim. If a patient is received into hospital for treatment of injuries "sustained in such circumstances that the injured person is entitled or (if he has died) was during his lifetime entitled to recover from some other person damages for such injuries," then the person liable to pay such damages "shall also be liable to pay to the governing body of such hospital" damages measured according to the expenses incurred by the hospital in such treatment. The damages recoverable by the hospital are to be measured as follows: they are to consist of a reasonable sum for the treatment, subject to the deduction of any sums paid to the hospital by the patient. If the patient has been maintained in the hospital for treatment, the "reasonable sum" for maintenance is not to exceed the lesser of the two following scales—namely, (1) the rate of 9s. a day, or (2) the average daily cost of maintaining a patient in that hospital. The motorist's liability to reimburse the hospital will, it seems, be a risk to be included in the compulsory insurance policy. The cost will therefore fall on the insurance company which will naturally demand a higher premium. This machinery for reimbursing hospitals through the insurance companies has not been adopted in the English enactment, though the Road Traffic Act of 1930 may some day be altered in this respect if the insurance companies decide upon the extra cost of the additional cover, and fix a reasonable increase of premium.

The main point on which lawyers are likely to concentrate is that the proposal enlarges the normal scope of a contract of insurance. A, a motorist, agrees to pay an annual sum to B, an insurance company, in order to obtain protection against third-party risks. But, if the clause becomes law,

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[1] Kon, S. K., and Mayzner, M.: THE LANCET, 1931, i., 794.

[2] Hess, A. F., Lewis, J. M., and Thomas, B. H.: Jour. Amer. Med. Assoc., 1931, xcvii., 370.

Y, a hospital, will be entitled to sue A for injuries to Z, the victim of a traffic accident. It may be noted that the new clause will only apply to accidents where the motorist's negligence is established. The hospital, therefore, will not only have the trouble of conducting actions against possibly elusive motorists in whatever may be the Free State equivalents of of our county courts and High Court; it will also have the whole expense of the proceedings if the proof of negligence fails; and it will need to keep in touch with its patients who may be wanted as witnesses months after they are discharged from the wards. The contingency of the patient's death from injuries is provided for; is it clear what happens if the motorist dies? The clause will benefit the hospitals by enabling them to sue where otherwise they have no legal remedy. But there are many traffic accidents where negligence either is not, or cannot easily be proved to be, the cause; allegations of negligence—not to mention allegations of contributory negligence—are often strenuously fought. The hospitals therefore may have bought their new remedy at the price of a string of law suits. Meanwhile, the existence of a system of compulsory contribution to a hospital may disincline both motorist and patient to make any direct and voluntary payment.

NERVES IN TUMOURS.

If the diversity of growths which we classify together as tumours can be said to have any one feature in common it is their functional dissociation from the rest of the body. Anatomically this dissociation has commonly been held to be represented by the absence both of coördinated blood-supply and of nerves. In fact, some tumours have been shown to be surrounded and permeated by a newly formed system of capillary vessels, and even if we look on this development as part of the connective tissue reaction aroused by the tumour, the effect is that the tumour does obtain some of the oxygen which it needs. Something of the same kind may also be true of nerves. Awhile ago Prof. Hurst Oertel, of Montreal, urged that in some cases nerves could be demonstrated in tumours ending in such intimate relation with the parenchyma that their essential nature could hardly be doubted. In the *Journal of Pathology and Bacteriology* for September he returns to the subject with fuller technical details and more ample illustrations, mostly from cancers of breast. It is exceedingly difficult to be sure what the appearances seen and pictured really represent. They certainly look like nerves and nerve-endings, but the silver impregnations by which they have been obtained are liable to behave in curious ways, and it is possible that the findings in tumours are not nerves at all. And again, granting that they are nerves, it may be that they are residua of the tissue invaded by the growth or irritative responses in the neighbouring connective tissue, such as have been amply demonstrated in mouse tumours. On the whole, however, we should be inclined to accept the conclusions to which Prof. Oertel's long inquiry into the subject has led him, and agree that he has demonstrated that some tumours have a nerve-supply to or from the tumour cells themselves. This is by no means the same as saying that all tumours have nerves; nor are Prof. Oertel's findings at any real variance with those of, for example, Dr. Ludford, who has searched for nerves and failed to find them. We gather that Prof. Oertel himself has failed much oftener than he has succeeded. This is, in fact, about what we should expect on general grounds; tumours grade almost imperceptibly from normal tissues to the most bizarre and monstrous formations, and they have no general rules to which there are no exceptions. It would be natural for some of them to have nerves and others none, just as some of them probably have blood-supplies of their own, while others do not. Functionally, tumours of the thyroid, anterior pituitary, suprarenal cortex, parathyroids, and islands of Langerhans may be so related to the body that they produce the obvious effects of excesses of their internal secretions; anatomically, certain tumours may well have some simulacrum of the normal arrangements.

LOSS AND GAIN OF HOOKWORMS.

Hookworm infections are happily of limited duration. Those who have had no chance of reinfection for six or seven years rarely pass the eggs of these parasites, and worms are, for the most part, completely absent after this period. These facts have been known since the early days of hookworm investigations, and observers have been concerned chiefly with the rate of the diminution of infection. Egg counts made on prisoners in India by C. F. Fearnside in 1900, and in Burmah by P. K. Tarapore, in 1913, suggested that the diminution was gradual. This, too, was S. T. Darling's opinion on realising how slowly Tamils in Batavia added ancylostomes to the load of necators which they had brought with them from India; his facts were obtained by counts of worms recovered after anthelmintics, and in his conclusion the belief is implicit that in any country the average worm load is fairly constant, and that gain and loss run parallel. But Darling measured only the balance between gain and loss, which is no necessary measure of the rate of either; while in the investigations on prisoners it was assumed that any opportunity for gain must have been absent or nearly absent.

Assuming a fairly constant average worm load among prisoners admitted to a Calcutta jail, A. C. Chandler[1] satisfied himself by egg counts on the stools of men who had been in prison for varying periods that, following their admission, there was a rapid initial and a later gradual fall in the number of eggs passed; and he claimed that his conclusions were supported by the curves obtained by K. S. Mhaskar,[2] who treated men who had been in a Madras jail for varying periods and counted the worms passed. P. A. Maplestone,[3] however, working in the same jail in which Chandler had worked, obtained quite different results. His method was the more satisfactory, comprising monthly egg counts on the same men throughout a year. His average counts showed no fall in egg numbers as imprisonment lengthened. On the contrary, there was a seasonal variation, with a maximum in May and a minimum in October. He pointed out that some prisoners in this jail were employed in extramural work, so that the occurrence of fresh infections could not be excluded. Maplestone's early and late figures were not, however, strictly comparable, for men were leaving the jail steadily and the fraction which remained throughout, and alone furnished the later figures, may not have had the same original average egg count as that given by the total number with which the investigation began.

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[1] The Rate of Loss of Hookworms in the Absence of Reinfections, Indian Jour. Med. Res., 1926, xiii., 625.

[2] Hookworm Infection and Sanitation, Ibid., 1920, viii., 398.

[3] Seasonal Variation in Hookworm Infection, Ibid., Oct., 1930.

G. C. and F. K. Payne[4] have since attacked the problem from another angle. They point out: (1) that, accepting Chandler's curves, an infection of 1000 worms must be accompanied by an average loss of 40 worms a week during the first three months after infection ceases to be acquired, with the bulk of the loss concentrated in the early part of the period; (2) that this considerable loss should be easily detected both by recovery of worms from the stools and by a lessened egg content of the stools. In order to investigate this point they took into hospital two persons whose egg counts showed them to be heavily infected, and observed without treating them for 16 and 19 days respectively. During this period scrupulous personal examination of all stools revealed two worms only in one case, and one only in the other, while in neither was there any discernible lessening of the number of eggs passed. Since, after treatments, these persons voided over 3000 and 1350 worms respectively, and even then were not quite free from infection, the number of worms passed in the pre-treatment period was about 1 per cent. of that required if Chandler's curves held in conditions other than those obtaining at the beginning of imprisonment, with whatever this implies of preliminary anxiety, and subsequent alterations in diet and mode of life. Recent experience is, then, against the conclusion that in ordinary conditions hookworms are rapidly lost after infection. Rather is the older conclusion correct, that the loss is slow and gradual, some parasites persisting for six or seven years. Treatment should not, then, be withheld in the expectation that, by natural loss of worms, the load of infection will rapidly be reduced to a figure which a certain phase of opinion holds to be negligible. The rate of gain of hookworms by any man will, of course, vary with the misfortune, or sanitary misbehaviour, which brings his skin into contact with some heavily infected spot.

RURAL AND URBAN DEATH-RATES IN FRANCE.

IN a report communicated by Mr. Marcel Moine, the statistician, to the standing committee of the Office International d'Hygiène Publique, and published in its *Bulletin* for August, some instructive comparisons are made between the death-rates of the country and the town. This study does not include the whole of France, but only certain rural and urban districts, the period under review being the year 1928. It was found that the 114,199 deaths in the urban group were equivalent to a death-rate of 15·3 per 1000, whereas the 42,664 deaths in the rural group were equivalent to a death-rate of 17·8 per 1000. In the same year the death-rate for the whole of France was 16·5 per 1000. Up to the age of 19 the death-rate was considerably higher in the urban than in the rural groups, but between the ages of 20 and 39 the reverse was the case, and in the oldest age-group the death-rate was higher in the rural than in the urban group. Such diseases as those of the heart and kidneys, which do not take a heavy toll of life before the age of 40, were found after this age and for the rest of life to be much more frequent as causes of death in the urban than in the rural group. As for the diseases of the respiratory system other than tuberculosis, the mortality therefrom was definitely higher in the urban group up to the age of 10, and again after the age of 45. Between the ages 25 and 49, the proportion of deaths by violence was higher in the rural group. In the urban group it was the rule for the deaths to be notified by a qualified practitioner, whereas this was the case in only 40 to 76 per cent. of the deaths in the rural areas. There were however two rural areas in which 99 and 90 per cent. respectively of the deaths were notified by a qualified practitioner. It would therefore seem that there should be no insuperable obstacle to this practice becoming general throughout country districts.

OCCUPATIONAL HAZARDS OF CHROMIUM PLATING.

THE discovery of chromium plating has brought with it some new occupational risks. These are explained in a recent article by Dr. A. Langelez.[1] He explains that metal objects to be plated are suspended in a bath of chromic acid, and the large volumes of hydrogen released from the cathode carry with them into the air a brownish fog of the atomised liquid. This vapour may damage the skin, the mucous membranes, and the eyes. The skin lesions vary considerably, sometimes taking the form of erythema, sometimes of superficial burning, and in certain predisposed subjects, especially those who perspire freely, of eczematous dermatitis. The fluid is said to have a caustic action on injured skin, producing a hard and painful ulcer, which may penetrate the bone, and has earned in Belgium the name of *rossignol* or *pigeonnau*. These chromium holes, already familiar among chemical workers in chromium compounds, are now encountered among workmen in chromium plating. The ulcers are particularly frequent in the interdigital spaces, the borders of the nails and the knuckles; they progress slowly, and will not heal while the patient is still in contact with the chromium. Treatment is identical with that of burns. The only method of protection hitherto attempted has consisted of long rubber gloves, but even if these remain intact, the continual perspiration is not good for the skin. A dressing is being tried, composed of one part of lanoline to three of paraffin; this is washed off after work, and the affected parts are bathed in a mixture of commercial alcohol one-quarter, hydrochloric acid one-quarter, and water one-half. Some authorities recommend a wash in 2 per cent. sulphate of iron. The results obtained from these applications have not yet been reported; ancillary measures include the use of indiarubber aprons and suitable footgear.

Chromium dust, as encountered in chemical works, is said to form chromium oxide on the cornea between the eyelids; the deposit appears as a brown discoloration, and ultimately impairs the vision. Vapour will not produce this effect, but if the liquid is accidentally splashed into the eye or rubbed in with a finger it may cause burning and ulceration of the cornea, with irreparable damage. This danger may be averted by properly designed goggles. Chromium seems also to have a peculiar affinity for the nasal mucosa, and characteristic lesions occur among those exposed to the vapour. Besides a chronic coryza, a number of workers suffer from an injury of the septum, the site of election being at the level of Jacobson's organ. According to Dr. Langelez, the mucosa atrophies slowly, grows pale and ulcerates, and the cartilage perforates in a few days to a diameter of ½ cm. to 1 cm. In some cases there is considerable phagedæna. This lesion is painless, and does not interfere with nasal function; some workers do not know that they have been attacked until they are medically examined. If the patient leaves work, the injury scars over in a month or two. Manufacturers are now using aspirating apparatus to draw off the noxious vapour, and the workers are being advised to block the nostrils with cotton-wool soaked in paraffin, tincture of myrrh, or silicic acid. The latter precaution, however, makes mouth-breathing inevitable, and facilitates the absorption of the vapour. A respirator would get over the difficulty, but its prolonged use is tiresome, and workers are not easily induced to submit to it. It is possible to protect the nasal mucosa with a film of zinc oxide or balsam of Peru. If chromium plating has come to stay, this new hazard will demand close attention.

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[4] Observations on Rate of Loss of *Necator Americanus*, Amer. Jour. Hyg., July, 1931.

[1] Bruxelles-Médical, 1931, xi., 1301.

UROSELECTAN AS A RENAL EFFICIENCY TEST.

SINCE the introduction of excretion urography methods for the radiography of the kidneys, the possibilities of this technique as a means of estimating renal efficiency have been widely considered. Uroselectan, which was the dye first introduced for outlining the pelvis of the kidney radiographically, contains 42 per cent. by weight of iodine and is thus opaque to the X rays in quite dilute solution. It has a very high specific gravity and is excreted almost entirely in the urine, though there is probably some slight elimination through the liver as well. Given intravenously it is almost completely non-toxic, though it causes some fall in blood pressure and more serious risks in patients with badly diseased livers. A. V. Lichtenberg, who has been in the main responsible for the introduction of excretion urography, did not anticipate that uroselectan would be of service in the investigation of renal function,[1] but it appears that the excretion of uroselectan shows a relatively close relationship to the excretory powers of the kidney in general. The presence of uroselectan in the urine is shown by an increased specific gravity, which may rise to as high as 1060 some three to four hours after the injection, or by its precipitation with acid, or by the iodine reaction with starch solution. With seriously diseased kidneys for instance the dye is so badly excreted that only a poor shadow or no shadow at all can be seen by the X rays. With healthy kidneys the excretion is rapid and complete and, since the dye is non-toxic and passes unchanged from the body, no harm to the kidneys results.

Drs. L. Villa and P. Introzzi[2] have recently proposed a technique for the use of uroselectan as a renal efficiency test in medical diseases of the kidney. Their method is briefly as follows:

> A catheter is passed in the morning whilst the patient is fasting, and the bladder emptied; the specific gravity of this specimen of urine is noted. The catheter is left in position and the patient then drinks 300 c.cm. of water; in 15 minutes the urine is drawn off and its specific gravity again recorded. A solution of 10 g. of uroselectan in 30 c.cm. of distilled water is then slowly injected intravenously, some two to three minutes being taken in the procedure. After the injection the urine is collected every two to three minutes for about 20 minutes, and then every 15 minutes for a further period of one hour. The catheter is then withdrawn, but all urine passed until the following morning is saved (for the first six to ten hours in two-hourly portions). Ordinary food may be taken during this time. The volume and specific gravity of the urine in the specimens is noted and the presence or absence of free iodine is ascertained by a simple test, using starch as indicator. In normal cases the iodine reaction first appears in the urine excreted between the second and third minute after the injection and reaches a maximum in that excreted during the next six to eight minutes. Excretion of iodine continues for between four to eight hours. The specific gravity of the urine after the patient has drunk the water falls low and after the uroselectan injection rises from 1001–1003 to 1006–1008 in four minutes, 1015–1016 in seven to eight minutes, and 1020–1022 in 12 to 14 minutes. At this height it remains for some 15 to 30 minutes.

The amount of urine excreted is *higher after* uroselectan than after simple water drinking without injection of dye. The test therefore estimates particularly the speed of excretion, as well as the degree of excretion of the dye. The authors consider an initial appearance of the iodine reaction later than five to six minutes after the injection of uroselectan as pathological, and a persistently low specific gravity or a delayed rise as having a similar significance. The total duration of the excretion they view as less important. They believe that this test will detect renal function deficiency whilst other tests are still negative; and it has the further advantage that the total time required is only some two to three hours.

Uroselectan shares, with other dye tests, the theoretical disadvantage of being an abnormal substance for the kidney to excrete, and of giving information only as to the capacity of the kidney to eliminate this substance. It is not proved with certainty that this capacity always runs parallel with capacity to excrete other substances. It is, moreover, not yet certain that the rate of excretion is a factor that is affected earlier in kidney disease than, let us say, the quantity excreted. The fact that large doses of uroselectan as given, for example, for intravenous pyelography may have serious consequences in cases of serious renal insufficiency, and even fatal results in the presence of such a condition as polycystic kidney, need not necessarily condemn the test, since Drs. Valli and Introzzi use smaller doses than is customary for radiological purposes. The multiplicity of renal efficiency tests however, together with the realisation that large portions of kidney tissue may be entirely destroyed before any defect in function is evident, has led to some doubt whether any dye excretion methods have much value. Whether this one is more delicate than its predecessors remains to be established.

A HOSPITAL AMBULANCE.—The Newcastle-on-Tyne West End Charities Committee has presented its ambulance to Newcastle Infirmary, the growth of other facilities having rendered it unnecessary for the committee to continue its own ambulance service.

TUBERCULOSIS POST-GRADUATE COURSE.—The Joint Tuberculosis Council has arranged a course of study to be held in South Lancashire from Monday, Oct. 19th, to Saturday, Oct. 24th. The course will open at 2 P.M. on Monday afternoon at the Tuberculosis Dispensary, Hardman-street, Manchester, when Dr. G. Lissant Cox and Dr. D. P. Sutherland will discuss Central Administration. On Tuesday, at 10 A.M., Dr. G. Jessel will give demonstrations at the Tuberculosis Dispensary and Light Centre, Eccles, and at 2.30 P.M. Dr. H. G. Trayer will deal with pathology and the problems of hospital treatment at the Baguley Sanatorium, Altrincham. On Wednesday, at 10 A.M., at the Manchester Dispensary, the subject of Pneumoconiosis in Stone-masons will be considered by Dr. P. Heffernan, in Miners by Dr. A. Pask, and in Cotton-operatives by Dr. G. Fletcher. At 2.30 P.M. Dr. Jessel, at the Peel Hall Pulmonary Hospital, will cover such matters as Lipiodol, Artificial Pneumothorax, Sanocrysin, and Blood Sedimentation in diagnosis and treatment. On Thursday, at 10 A.M., Dr. P. Edwards, at the Manchester Dispensary, will deal with Artificial Pneumothorax and Allied Therapy. The items will include visits to the East Lancashire Sanatorium, the Village Settlement at Barrowmore Hall, and a round-table conference and discussion on the Saturday morning. Information from Dr. W. Brand, hon. sec. for post-graduate courses, 8, Highway Court, Beaconsfield, Bucks.

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[1] Brit. Jour. Urol., 1930, ii., 341.

[2] Med. Klin., 1931, xxvii., 1312.

SPECIAL ARTICLES

ECONOMY IN THE SOCIAL SERVICES.

REPRESENTATIVE VIEWS.

IN Circular 1222, issued on Sept. 11th by the Ministry of Health, local authorities are asked immediately to subject to careful and detailed scrutiny the whole field of their expenditure, examining for example whether full value is being obtained for money spent, what savings can be made in the administrative machine in all its branches, and whether development of any services cannot safely and properly be slowed down till better times. Notice has been too short for any wide consultation of medical officers to these authorities, but we have obtained the first thoughts of some administrative heads of large medical departments, of which two samples are set out below. For obvious reasons these views, and any others which may reach us from similar sources, are anonymous, and on all sides criticism and discussion will be welcome.

I.

My view is that saving might include a drastic review of all capital expenditure scheduled for this and next financial year. Many authorities were intending to spend large sums of money on institutions transferred from the guardians, and it is difficult for them to resist demands from technical staffs for new wards, laboratories, staff quarters, equipment, apparatus, and so forth. I am certain that most of this expenditure can be postponed without irreparable loss, and in fact with some gain if it implies a review of existing accommodation.

Each service should be reviewed with an eye to adjustments making for more economical working rather than the cutting out of any particular activity. In institutions in particular a good deal of saving should be possible in the aggregate by supervision of such items as (*a*) water, electricity, gas, telephone; with comparison between the various sections. (*b*) Laundry arrangements, where the allowance is too lavish either for wards and staff. (*c*) Food wastage, with control of refuse from kitchens and wards. Staff diet to be not above the standard of an ordinary middle-class household. (*d*) Fuel, its proper use. (*e*) Stores, drugs, appliances, chemicals, dressings; with comparison of wards and methods of checking. (*f*) Routine of duties of each member of staff to be checked individually.

Disinfection of houses after infectious illness might well be reduced substantially in most cases in favour of a thorough spring-cleaning. Drain-testing as a routine after cases of infectious disease, which is still often done, is sheer waste of time and energy.

Economies might be made in the use of hospital beds. (*a*) Far too many mild cases of scarlet fever are admitted to fever hospitals instead of being nursed at home. Scarlatinal serum can be supplied to practitioners to minimise complications. (*b*) A considerable proportion of the cases of diphtheria sent in by practitioners to hospital are not clinically diphtheria. They are often sent out on or about the tenth day, but even this is too long. (*c*) Public assistance institutions for acute or chronic sick, aged or infirm, might be greatly relieved if district medical officers were not so ready to send patients into institutions instead of continuing treatment and supervision at home. An increase in medical and relieving officers to meet their requirements would pay handsomely. Institutions cannot at present refuse to accept patients sent in by the relieving officer, many of whom would prefer to remain at home with a little help. (*d*) Colonies and schools for mental defectives tend to become too elaborate, too luxurious, and too technically staffed, and the same is true of nursery schools. I do not think these should be cut out, but they should be run with a more modest eye.

Much of the work under the Food and Drugs Acts could be cut out if the Ministry of Health would lay down more drastic standards and conditions of food preparation.

At infant welfare centres the machinery should be overhauled to see whether each member of the staff is pulling full weight. The supplying of milk, fresh or dried, through such centres is a grave waste of energy and damages their value as advisory centres. If mothers were referred for foods to the public assistance there would be less temptation to trade on the local authority. Much time is wasted by health visitors or school nurses in calling twice or more on cases of minor infection reported from school; the first visit to detect, the second to release for school. The leaving at the first visit of a slip with date for return entered by the health visitor would save time for more important work; parents helped by attendance officers rise quite well to their responsibilities.

To summarise. The lines of action seem to be: the saving of bricks and mortar; careful review in detail of each service, with pruning everywhere rather than cutting out any one section; particular regard to extravagant administration of institutions; the need for the staff to remember what would be their own standard if they were living on their own income at home.

II.

The proposed cut of £150,000 in the direct cost to the Exchequer of public health work reflects only to a very slight extent the cuts which it is anticipated local authorities will make, in view of the fact that the Local Government Act of 1929 abolished percentage grants for most of the public health services, consolidating these grants in a block grant in which the new budgetary proposals make no alteration. This means, of course, that savings effected by local authorities will not appear as any reduction in Government expenditure. The only services directly administered through health departments which remain on the percentage grants, and cuts in which will therefore appear in the £150,000, are the port sanitary service and the school medical service. Fifty per cent. of any savings in the former cannot amount to much, but school medical inspection and treatment are expensive. If it is proposed to slow up housing schemes this would account for a substantial proportion of the £150,000.

Circular 1222 points out that other local government officers should in equity share in the reductions which the Government have been able to impose upon teachers and the police. Such reductions will, for the reasons given, make little difference to the Exchequer, but will, if they are in anything like the same proportion, effect substantial economies in local administration. A large proportion of the expenditure of public health departments is attributable to salaries, and that must apply to all service which depend mainly on personnel and not so much upon occupation of premises and provision of goods.

As regards the relative value of the different medical services, there will be great variety of opinion. Nearly all of them are of recent establishment, and aim at conserving and improving the health of children and teaching them how to lead healthy lives, so that they may reach adult life fit to enter employment and capable of looking after their own health when they have left our hands. It will take a generation to tell whether these services have done what they set out to do, and even then the picture will be confused, because of the effect upon health of fluctuations in the standard of living. All we can say is that they are doing something to meet a need which has been obvious for many years, not only to the medical profession, but also to every thinking member of the community, and that it can be demonstrated in individual cases that they are doing good. In some areas, perhaps many, measures have been adopted which are not worth the money spent on them.

Special schools for the mentally defective are expensive, and would become a serious item of expenditure if they were sufficiently developed, as they are not in most areas. They are, however, serving not only the purpose of educating defectives, but, more important still, of removing from ordinary school classes children who are a terrible drag on their work. Many people would be surprised to learn the extent to which definitely defective children who have been taught in these special schools are employed and doing good work even at this time of grave unemployment. Indeed, there is something in the methods of teaching adopted in these schools which I hope will convey a lesson applicable to the ordinary school child.

I should rather see a pound or two saved here and there on our services than the crippling of any one of them. It has been my view for many years that too much emphasis has been laid upon housing in relation to ill-health, and that more has been spent on housing than we can afford. In view of the provision which has already been made by local authorities, and the certainty that the population will shortly be on the down grade, I think expenditure on housing should receive careful scrutiny.

I should not be sorry if shortage of money forced us to reconsider some of our well-established practices in relation to the control of acute communicable disease. Disinfection could certainly be cut down without disastrous results, but as an item of expenditure it is comparatively trivial. Child welfare centres for healthy children cost very little, and their work is of the genuinely preventive kind, which I think it would be most unfortunate to discontinue. We spend a great deal too much money on the hospital isolation and treatment of scarlet fever, because the medical profession and the public have come to expect it. In order to deal with epidemic fluctuations of this disease, we retain a number of beds and a considerable staff, which costs money. Moreover, we isolate and treat a very large proportion of all the cases of diphtheria, however mild, which occur in towns, because we cannot risk allowing a disease which has still a considerable percentage fatality to spread among the children in populous areas. Diphtheria immunisation, and possibly also scarlet fever immunisation, although they are not all that America has led us to believe, are of a sufficiently proved prophylactic value to merit their adoption on a much larger scale than they have been practised in this country.

The national maternity scheme will now be definitely suspended, and, I think, without serious hardship. The proposal was merely a consolidation of measures already taken piecemeal. I do not think that midwifery will suffer immediately to any material extent as the result of its postponement. In any case it was bound to be a matter of many years before any such scheme became efficient.

To sum up, I am all out for economy in administration, and strict supervision of every detail of expenditure. It is possible for big public departments to be grossly extravagant in small items, the cumulative effect of which is quite substantial. Some local authorities approach public health administration from a sentimental, rather than a business, point of view, and a medical officer encouraged in this way is not likely to concern himself much about details of costs. If I had to recommend curtailment of expenditure on any one branch of my work, I should be inclined to select the institutional segregation of mental defectives.

A STUDY OF CONTACT INFECTION IN TUBERCULOSIS.

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An outline of the investigation upon which this paper is based has been given in a previous communication.[1] That contained the actual results of gross tuberculous infection among 833 contacts of the 185 households of fatal sputum-positive cases of phthisis which were investigated in North Worcestershire. It is my intention here to carry the analysis somewhat further, in an attempt to estimate the part played by various factors in the ætiology of the secondary tuberculosis which occurred in this group of house contacts.

1. SEX OF THE CONTACT.

Table I.—*Contacts of the Age-group 0–5 Years.**

Children 0–5 years.	No.	Death-rate per 1000 ; all causes.	Tuberculosis death-rate per 1000.	Total tuberculosis incidence per 1000.
Male	85	200	94·1	188·2
Female	71	211·3	42·3	183·1

Table I. shows that the sex of the contact seems to have little influence upon either the death-rate from all causes or upon the total tuberculous incidence-rate. The tuberculosis death-rate is, however, significantly heavier among male infants. Female children appear to resist the disease better than male children up to the age of 5 years, but a conclusion is hardly justified on account of the small number of deaths involved.

The results shown in Table II. allow of the following conclusions :—

(1) In the age-groups 5–15, 15–25, and 35–45 years, the phthisis incidence-rates are greater among females in sputum-positive households than among males. (2) Among contacts over the age of 45 in sputum-positive households the phthisis incidence-rate is

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* In order to avoid a statistical fallacy, the 0–5 years age-group of contacts has been dealt with by a special method. The reasons for this method and the method itself have been outlined in a previous communication.

greater among males than among females. (3) The phthisis death-rate is significantly greater among female contacts up to the age of 25 than among male contacts. Over this age the male death-rate from phthisis is greater than the female death-rate. (4) The greatest death-rate and the greatest incidence-rate from phthisis among female contacts fall in the age-group 15–25. (5) The greatest death-rate from phthisis among male contacts is found in the 15–25 age-group, but the greatest incidence-rate occurs in the age-group 25–35. (6) Among contacts over 5 years old the incidence of phthisis is greater among females than among males in the ratio 100 : 70. The death-rate from phthisis is also greater among female contacts over 5 years than among contacts of the male sex over 5 years, in the ratio 100 : 84.

TABLE II.—*Tuberculosis Morbidity and Mortality Among House Contacts Over 5 Years of Age.*

(Rates per 1000 contacts in each sex age-group.)

Age-groups.	A. MALE CONTACTS.					B. FEMALE CONTACTS.				
	Contacts.	Death-rates.		Incidence-rates.		Contacts.	Death-rates.		Incidence-rates.	
		N.P.T.	P.T.	P.T.	All forms		N.P.T.	P.T.	P.T.	All forms
5–15	81	12·3	—	73·9	110·9	89	11·2	11·2	89·8	157·2
15–25	98	—	40·3	91·8	102·0	96	—	62·5	187·4	197·8
25–35	52	—	35·5	96·2	96·2	64	—	31·3	125·1	125·1
35–45	21	—	—	95·2	95·2	48	—	20·8	125·0	125·0
45–up	82	—	12·2	36·6	48·8	104	—	—	28·8	28·8

N.P.T. = Non-pulmonary tuberculosis. P.T. = Pulmonary tuberculosis.

Thompson[2] said: "If we once grasp the idea that the male has a superior power of resistance to attacks of phthisis than the female, we shall experience no difficulty in understanding the apparent anomalies in family phthisis." It may be suggested that the heavier incidence of phthisis on female contacts is due to their greater domesticity and consequent increased intimacy of contact, and not to any constitutional inferiority in resisting power. This may be a factor, but it is significant that over the age of 45 the phthisis-incidence is greater among men than among women in these sputum-positive households, for women do not become less domesticated after the age of 45 is reached. I suggest that the greater susceptibility of the female to gross contagion in the home during her active sexual life can be explained by application of the theory of allergy.

During menstruation there is a depression of the allergic state (as measured by tuberculin skin reactions); this also obtains during pregnancy and parturition (Baldwin, Petroff, and Gardner[3]). Thus an infected female between the ages of 12 and 45 is continually undergoing cyclical variations in allergy, whereas a male continuously exposed to gross infection has a gradually increasing degree of allergy. At the menstrual period the female can be infected by a smaller dose than the male. *Two weeks later she will now react to tubercle bacilli more vigorously than the male.* Such an alternation is likely sooner or later to produce manifest *disease*.

This application of the theory of allergy would explain the greater susceptibility of the female during active reproductive life. It would also explain why active tuberculosis rarely shows itself until the puerperium. During pregnancy the degree of allergy is lowered, so that the pregnant woman is easier to *superinfect, but is less likely to react vigorously to* superinfections. In the puerperium the rise in the degree of allergy initiates reactions round foci of *tubercle bacilli* which previously did not provoke *reactions, and manifest* disease may result from these reactions.

It must be recognised that this is pure theory, but I feel that it has the merit of allowing some visualisation of the possible processes at work.

2. SEX OF THE PRIMARY SPUTUM-POSITIVE CASE.

Table III. affords the following conclusions:—

(1) Among contacts up to the age of 15 in an infected household the tuberculosis incidence and the death-rate are greater where the source of infection is a female than where the source of infection is a male. (2) Contagion in a household is equally dangerous to contacts between the ages of 15 and 35, whether the infectious case is a male or a female. (3) The evidence is suggestive, but not conclusive, that among contacts over the age of 35 the tuberculosis incidence is greater where the infectious case is a male than where the infectious case is a female.

TABLE III.—*Rates per 1000 in each Age-group.*

Age-group.	Contacts of male infectious cases.			Contacts of female infectious cases.		
	No. in group.	Tb. D.-R.	Tb. I.-R.	No. in group.	Tb. D.-R.	Tb. I.-R.
0–5	94	53·2	106·4	62	96·8	177·4
5–15.. ..	97	10·3	103·1	73	27·4	178·1
15–35.. ..	163	49·1	128·9	147	40·8	142·8
35–up ..	133	7·5	67·7	122	8·2	49·2

Tb. D.-R. = tuberculosis death-rate. I.-R. = incidence-rate.

AGE OF THE PRIMARY SPUTUM-POSITIVE CASE.

The age of 35 was selected as a dividing line; thus the contacts are divided into two groups. The first group, A, is made up of contacts in households where the sputum-positive case was under 35 years of age at death. The second group, B, is made up of contacts in households where the sputum-positive case was aged 35 years or over at death.

TABLE IV.—*Rates per 1000 in each Age-group.*

Age-group.	A. Contacts of cases under age 35.			B. Contacts of cases over age 35.		
	No. in group.	Tb. D.-R.	Tb. I.-R.	No. in group.	Tb. D.-R.	Tb. I.-R.
0–5	90	77·8	166·7	66	60·6	90·9
5–15.. ..	89	22·5	134·8	81	12·3	135·8
15–35.. ..	197	40·6	162·4	113	53·1	88·5
35–up ..	170	11·8	47·1	85	—*	82·4

—* = No deaths.

It will be noticed in Table IV. that contacts under 35 years' old suffer a significantly greater tuberculosis incidence when the infectious case is also under 35 than where this case is over 35. On the other hand, contacts over 35 suffer a heavier tuberculosis incidence when the primary case is also over 35. It also appears that, in the aggregate, sputum-positive cases to have a bona-fide belief that no licence was required, the summons was dismissed under the Probation of Offenders Act on payment of three guineas costs.

The compulsory licensing provision does not apply to establishments carried on by registered medical practitioners who comply with certain prescribed formalities, nor to recognised hospitals and infirmaries; there is also an exception for hairdressers who give face or scalp massage or manicure treatment to female customers. An applicant for a licence must state his or her name, age, nationality, and technical qualifications as well as the nature of the proposed establishment and the business to be carried on. Some years ago scandals in connexion with bogus massage establishments were not unknown. The London County Council Act authorises the licensing authority to make by-laws "for the prevention of immorality" in licensed establishments, and for the keeping and inspection of records showing the persons employed and the general character of the business. Authorised officers of the L.C.C. may enter and inspect premises. An equally important point is that the by-laws may also prescribe the technical qualifications to be possessed by persons administering massage or other curative treatment. The London County Council Act of 1920 was not the first provision of its kind. There had been, for example, similar statutory requirements in Part V. of an earlier Act of 1915. The 1920 Act was closely followed in a Local Act obtained by Manchester in 1924. The Surrey County Council Act which received the Royal Assent at the end of last July contains provisions framed on the same lines but with a slightly wider definition of establishments for special treatment.

BUCHAREST.

(FROM OUR OWN CORRESPONDENT.)

OATS DIET IN DIABETES.

SOME years ago a German author claimed that an exclusive diet of oats has value in severe cases of diabetes mellitus, and now Dr. Oberth, of Brasov, publishes some further observations on this method of treatment. He has treated about 100 cases with varying results. The diet consists of oats given in large quantities, in the form of oat flour or flakes, together with albumin and butter, excluding all other carbohydrates and meat. The usual daily allowance consisted of oats 250 g., albumin (vegetable or from eggs) 100 g., and butter 300 g. This mixture was made into a soup and given every two hours. Wine or light brandy was occasionally allowed, and also strong black coffee. Dr. Oberth details a number of typical cases in which this régime was tried, and says that it seemed to give more favourable results than did other diets recently proposed. He does not, however, advise its adoption without careful preliminary trial in any particular patient, for he has observed cases in which it made the patient worse. The theoretical basis of this diet is under investigation.

BLOOD CHANGE AFTER HÆMORRHAGE.

In a recent lecture to the Medical Society Dr. Niculescu recorded some comparisons of the effect of hæmorrhage upon the composition of the blood in untreated persons, and in those being treated with arsenic and iron. He found that hæmorrhage produces more marked effects in the former. The leucocytes are increased, the change consisting chiefly of an increase of the polymorphonuclears, occasionally of the mononuclear cells. The solids, proteins, and total nitrogen of both blood and serum are affected to more or less the same extent. The qualitative change in the serum proteins consists in a relative increase of serum-albumin. The fibrin is increased and the coagulation-rate shortened. The blood-ash remains practically unchanged. Hæmorrhage during the administration of inorganic iron produces less deterioration in the blood than when the patient is untreated, and the administration of organic iron seems even more efficacious in preventing damage. The administration of arsenic alone has little effect except the number of leucocytes appears to be diminished instead of increased in this group of cases after hæmorrhage. The combined administration of iron and arsenic was found effective in diminishing the effects of hæmorrhage on the composition of the blood.

THE FATE OF GALL-BLADDER CASES.

A questionaire has recently been circulated to patients who have been operated on by certain well-known surgeons for gall-bladder disease, excluding cases of carcinoma. The object was to determine the results and after-effects of the operation. The statistics obtained suggest that the relief is generally permanent and the danger slight. Gall-stones had been deliberately left in one case, since the relation of the biliary ducts was so complex that no radical procedure could be attempted. Most of the other cases remained free from symptoms, and only in one case was a second operation required. Among 35 cases only one mucous and one biliary fistula resulted, and herniæ occurred in only two cases where suppuration had been extensive. Colic, due to adhesions, was reported by three patients; in two of these the appendix was removed, and in one a gastro-enterostomy had been performed. The suggestion is made that renal colic must be excluded before recurrent biliary pain colic is diagnosed, since the conditions have many symptoms in common.

VIENNA.

(FROM OUR OWN CORRESPONDENT.)

NEW PROFESSORS.

WITHIN the last year six chairs of the University of Vienna have become vacant—partly through death or illness, and partly through the age-limit. Every professor attaining the age of 70 is required by law to resign his position within the next year. The surgical professors Eiselsberg and Hochenegg resigned owing to age; the gynæcologists, Kermauner and Peham, died within half a year of each other, and both clinics for materia medica are vacant through the illness of Wenckebach and Ortner. After protracted negotiations with various scientists, the two gynæcological clinics have now been given to Prof. Georg Wagner, of Berlin, and Prof. William Weibel, of Prague. Both men were students at Vienna at the famous old school Schauta-Chrobak-Wertheim. Ortner's post has been taken over by Prof. Jagic, well known for his researches on blood and liver function; Wenckebach's is still vacant. One of the surgical clinics has been filled by Prof. Wolfgang Denk, hitherto chief of the surgical clinic of Graz, and a pupil of Eiselsberg. It is expected that the other surgical clinic will be accepted by Prof. Paul Clairmont, at present in Zürich, also a pupil of Eiselsberg. The directorship of the institute of orensic medicine, at present nominally held by

Prof. Habenda, who has long been an invalid, will be taken over by Prof. Karl Meixner, at present in Innsbruck. There will thus be many changes in university circles in the coming session.

THE LATE PROF. KOLMER.

News of the sudden death of Prof. Dr. Walter Kolmer came as a shock to the large number of his students and admirers. At the age of 52 he succumbed to an attack of heart failure while on a climbing holiday in the Alps. Prof. Kolmer was famous for his intimate knowledge of the fine anatomy of the eye, ear, and nose, and was also an authority on special sense physiology and on the morphology and histology of nervous structures. His command of comparative anatomy and histology of both the vertebrate and invertebrate animals made him an ideal director of the Institute of Morphologic Physiology attached to the University of Vienna. His early death is particularly unfortunate in that he had started building up a school of promising young researchers, none of whom is yet experienced enough to take his place.

ALARMING INCREASE OF THE NUMBER OF MEDICAL MEN.

The Municipal Board of Health published, in August, some interesting statistics dealing with the staffs of hospitals and with other medical men in practice in Vienna. It appears from the figures, that in December, 1930, 4732 practitioners and specialists were registered as entitled to practise besides 1823 dental surgeons and dentists; 11 per cent. of the medical practitioners were women, and 9 per cent. of the dentists. In the previous year there were only 4651 practitioners (475 women) and 1770 dental surgeons. The ratio of medical practitioners to population is now 1 : 3800, and that of dentists 1 : 1000. The situation is made more serious by the system of sickness insurance. During 1931 the output of graduate medical men from the University has increased still more and warnings against taking up the study of medicine have been issued by various corporations and boards. It is pointed out that the population of Vienna is slowly but steadily decreasing (from 2,000,000 in 1920 to 1,810,000 at present) and that the supply of medical men in Vienna is more than sufficient.

AUSTRALASIA.

(FROM OUR OWN CORRESPONDENT.)

ANTIVENINE BY AIRPLANE.

The mortality from snake-bite has remained stationary in this country during the past 15 years. As a direct result of extensive research into the pathology of snake-bite conducted at the Walter and Eliza Hall Research Institute at Melbourne by C. H. Kellaway and N. Hamilton Fairley, a supply of antivenine specific against tiger snake (*Notechis scutatus*) is now commercially available. Production was effected by coöperation of the Commonwealth Serum Laboratories with the research workers, and the serum is stocked by the depôts of the Commonwealth Department of Health throughout Australia. The problem of distribution is particularly difficult owing to the rural occurrence of the snake-bite. The State of Queensland, for instance, where the highest mortality from snake-bite occurs, has an area of 670,500 square miles, which is served by five serum depôts. The difficulty of distribution is accentuated by the high cost of the serum. The recommended dose of 6000 units costs retail £8 16*s*., and the country pharmaceutical chemist cannot be expected to outlay this amount on stock which might never be used. The solution of the difficulty lies in the use of the aeroplane in providing rapid transport of the serum, and fortunately airway communications in Australia are highly developed. This method has a parallel in the organised effort of the Antivenine Institute of America.

EMPIRE CONSULTATIONS.

A few days ago a medical man in Melbourne, Victoria, was anxious to obtain without loss of time the opinion of a British neurologist on the diagnosis of a particularly difficult nerve case which was in a hospital in Melbourne. With the consent of the relatives, he established telephonic communication with London, the history of the case was given, and a subsequent telephone communication a few hours later resulted in a helpful discussion. In order to facilitate consultations in the future copies of the London Telephone Directory would have to be available at various centres.

TOLL OF THE MOTOR VEHICLE.

With the increase in the motor vehicles in commission and the growth of the population, the greater will be the opportunities for misadventure and the longer will be the roll of victims of motor-car accidents. Statistics, however, show that the three factors concerned—namely, number of motor-cars, growth of population, and number of casualties do not bear uniform relation. Figures issued by the Government statistician of deaths caused by motor accidents in New South Wales last year show an increase of 24·5 per cent. in the number of such deaths, while during the same period the population increased by 1·6 per cent., and the average number of cars registered by 13·4 per cent. In other words, the increase in the fatality-rate far exceeds the increases in the other directions. The great majority of the pedestrians involved in accidents were either under the age of 15 or over the age of 64.

MATERNITY ALLOWANCE REDUCED.

As a result of the financial stringency the Commonwealth Government has announced that, as from July 20th, 1931, the maternity allowance has been reduced from £5 to £4, and will only be paid to parents who have an income less than £260 per year. It has for long been realised that the bonus has failed in its object of increasing the birth-rate and reducing the maternal mortality-rate. The bonus was claimed by large numbers of parents who were really not in financial need of it, and the annual expenditure of £750,000 is one which the country cannot afford.

THE SERVICES

ROYAL NAVAL MEDICAL SERVICE.

Surg. Lt. D. C. Drake is promoted to the rank of Surg. Lt.-Comdr.

The following appointments are announced: Surg. Comdrs. R. F. Quinton to *Vivid*, for R.N. Barracks, Devonport; and G. F. Syms to *Victory XI.*, for R.N. Hospital, Portland.

ROYAL NAVAL VOLUNTEER RESERVE.

Surg. Lt.-Comdr. J. B. Oldham to *Victory*, for Haslar Hospital; and R. W. H. Tincker to *Pembroke*, for R.N. Barracks.

ROYAL ARMY MEDICAL CORPS.

Lt.-Col. M. D. Ahern, having attained the age for compulsory retirement, is placed on retd. pay.

Maj. (temp. Lt.-Col.) E. M. Middleton to be Lt.-Col.

(Continued at foot of next page.)

offering an attractive diversity of interest and a reasonable prospect of promotion. The evolution of a perfect scheme, the report concludes, is in the interests both of the public and of the members of the service, and although it must be gradual, its importance must never be forgotten.

MENTAL HOSPITALS AS THEY ARE TO-DAY.

ALL who are interested in the welfare of persons afflicted in mind, as well as all those concerned in the administration of our mental hospitals, should read the second part [1] of the report of the Board of Control recently published. It is the supplement of the report which appeared earlier this year, and was reviewed in our issue of July 11th (p. 90). The new volume may be considered as divided into three parts—that devoted to an account of research during the year 1930, a statistical summary of the movement of patients in the mental hospitals of England and Wales, and copies of the reports of visiting commissioners at all these institutions.

RESEARCH AND PATHOLOGICAL INVESTIGATION.

About one-third of the hospitals have sent in reviews of their work, and though these reports do not include by any means all the research that has been undertaken they show evidence that the problems of psychiatry are seriously studied. A summary of this was given by the commissioners in Part I. of their report, and it is abundantly clear from the details now added that in certain hospitals at any rate the clinical work is of a high order. Cases are reported at length, showing an examination of patients conducted with scrupulous care, and that novel as well as routine methods of treatment are tried in a systematic way. In many hospitals there is a strong staff of consultant physicians and surgeons, so that effective treatment is available in all departments of medicine and surgery, and it is heartening to find the extent to which patients in our public mental hospitals have the advantage of the new developments in therapeutics and the readiness of the medical officers to apply them. In original research, apart from the investigation of individual cases, much is being done, and it would be unfair to expect striking results in a single year. Among the subjects under research are the following: Colloid sulphur therapy, investigations of hepatic efficiency, malarial therapy in general paralysis, cerebro-spinal fluid examination, protein shock therapy, *Brucella abortus* infections, acidophilus milk therapy, physical constitution and type of mental disorder, anaerobic and aerobic bacteriology in relation to mental illness, gold-sol problem, nitrogen metabolism, and carbohydrate metabolism. Nevertheless, in reading the reports the thought arises whether the workers in our mental hospitals are not too isolated. The hospitals are often in remote districts, and it is not easy for medical officers to attend scientific meetings, and when the effort is made there may be little to interest the enthusiastic worker. There is reason for a suspicion that some of the work reported would have been more valuable if the pathologist had not been separated from the general stream of scientific thought. It is true that the Board of Control (see Part I., p. 12) are hoping to arrange for greater coördination of research. No doubt the genius in science works largely alone, goes his own way, and spends little time in digging up reports of work by others. But such men are scarce, and the ordinary research worker cannot afford to neglect what is done elsewhere. On the whole, the reports are encouraging in showing that hospital authorities are alive to the importance of research, and that not a few medical officers spend laborious hours in the pursuit of knowledge, for which there is little hope of credit or return.

RECOVERY- AND DEATH-RATES.

The statistical returns give the number of patients, admissions, discharges, and deaths, and the recovery- and death-rates in all the public mental hospitals, in the registered hospitals, and in the London and provincial licensed houses. It appears that nearly 7000 patients were discharged recovered out of an average number resident of about 124,000, and there were admitted during the year 23,000 patients. Bearing in mind the increasing number of aged infirm patients that are sent under care, and the unfavourable nature of so many others, it is satisfactory that about 7 out of every 23 patients admitted recover. In the county and borough mental hospitals in England and Wales, taken by themselves, the recovery-rate on new admissions was 33 per cent.—for males 29·5 per cent., and for females 35·5 per cent. These figures are naturally dependent on the meaning given to the word recovery. Some regard it as a return to the status quo ante, the psychosis having passed off; others as meaning the ability to resume life in the world at large; and others only consider a patient to be recovered when thoroughly sound in mind. Besides these causes of divergence, much depends on the class of patients received and the social pressure which leads to certification. Thus, it is not surprising that the recovery-rate varies greatly in different institutions. The lowest recorded is 14·6 per cent., the highest 57 per cent., whilst there are 15 out of 99 hospitals with a rate below 25 per cent. and 14 above 45 per cent. Whilst it is not safe to draw any conclusions regarding success or failure of treatment in any particular institution, the broad general fact emerges that mental hospital treatment results in an encouraging number of recoveries. We may be reminded that in the bad old days, 150 years ago, the recovery-rate was even higher than at present, but that was clearly due to the nature of admissions. A very much larger proportion of cases of acute mental excitement were admitted in those days, and in those cases the prospects of recovery are much greater than in the ordinary run of admission at the present time.

The proportion of deaths to the average daily number of patients in residence was 6·7 per cent. The highest recorded was 12 per cent., the lowest 3 per cent., and both were from hospitals in the county of York. It is interesting to note the extent to which patients are discharged from certificates although not recovered and considered of sound mind. Last year 4200 patients were so discharged. The reports do not say what became of them; but the great majority will no doubt be to the care of friends, although some may have been transferred not under certificate to public assistance institutions.

THE DAILY ROUND.

The reports of the visiting commissioners necessarily show sameness in phraseology, seeing they are constantly referring to similar matters, and that there are statutory obligations to be fulfilled. In almost all cases they express approval of the way the hospitals are administered. In no case is serious fault found;

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[1] Lunacy and Mental Deficiency. Seventeenth annual report of the Board of Control for the year 1930. Part II. H.M. Stationery Office. 6s. 6d. Postage extra. This volume does not give any particulars of the mental deficiency institutions which are supervised by the Board.

and in not a single instance did the commissioners find anyone improperly detained. It must be remembered that the management of the public hospitals is vested in the local authority, and the Board of Control can only make recommendations for improvements. These deal frequently with overcrowding, and the urgent need in not a few hospitals for admission and convalescent blocks, so that newly admitted and those who are improving can be effectively cared for apart from the chronic patients. There are two sides to this question, for if almost all the recoverable patients are nursed apart, the remainder of the institution becomes more of an asylum than ever—merely a place of refuge for those unable to hold their own in the world at large. Conduct rather than recoverability must consequently play a large part in classification. Nevertheless the system, frequently mentioned in those reports, which places newly admitted, sensitive patients in close proximity to the noisy and degraded and chronic patients must be bad.

The increasing cultivation of handicrafts and occupations is an encouraging feature. In many hospitals specially staffed occupation centres contribute to the well-being of the patients, and some of these become the organising centre for occupation in all wards. It is pleasant, for instance, to read "in almost every ward we observed with satisfaction that patients, instead of sitting about in idleness, were encouraged, and in many instances engaged, in amusing and occupying themselves in work coming under the category of arts and crafts, the nurses, many of whom have received practical instruction, aiding and assisting them in their work"; and again, "The work done in the wards, under instructions of the ward sisters, at rug-making, fancy needlework, &c., is also worthy of note for the good it does in occupying the patients, but also as the funds obtained from sales of work can be used for amusements and other benefits to the patients." Occupation-therapy is, to an increasing extent, cultivated in our mental hospitals, and this in addition to the various trades and shops established for direct utilitarian purposes.

The commissioners frequently refer to the amount of parole given, and the extent to which leave of absence on trial is permitted. There appears to be a wide divergence of practice in these respects; in some, little freedom is permitted; in others, large sections of the hospital are administered on the open-door principle. One of the most responsible duties of the medical officer in charge is the decision whether a patient is fit for greater liberty, and this can never be shifted on to other shoulders. The impression gained on reading these reports is that the commissioners encourage a large measure of liberty. "Safety first" is a poor maxim in nearly all walks of life; in mental hospitals it can be cruel and deadening to a deplorable degree.

Much effort is directed to providing patients with books, games, entertainments, and much is done to brighten the wards and the gardens. Judging from the frequency to which reference is made to the gardens and exercise grounds used by patients, it would appear that these are often lacking in interest. Seeing that the only view of the outside world certain patients can obtain is limited to the prospect seen in and from the ward gardens, it is important these should be as attractive as possible. In some of the reports the word "airing-court" is used—an expression which suggests a limited court-yard paved with asphalt, with crowds of patients taking an airing, as in a prison-yard. We hope this picture is *unjustified*, for we find in several of the reports *appreciative* references to the ward gardens.

A *great deal of information* describing the conditions of life is given in these reports. We can hardly expect the printed reports to contain all the criticisms *and suggestions* for improvement made by the commissioners, nevertheless the general effect of their *perusal gives* a feeling of satisfaction that the insane are not only receiving skilled care and treatment, but that continuous effort is expended in making the lot of those who fail to recover as useful and as happy as their *conditions permit*.

ANNUAL REPORTS OF MEDICAL OFFICERS OF HEALTH.

THE following are 1930 statistics of one Yorkshire city and two Lancashire county boroughs:—

Name of district and estimated mid-year population.	*Birth-rate.*	*Death-rates per 1000 of the population.* All causes.	Tuberculosis.	Cancer.	Respiratory diseases with influenza.	*Heart disease.*	Death-rates per 1000 births. Infant and neonatal mortality.	Young child (1–5 yr.) mortality.	Maternal mortality from childbirth.
Sheffield .. (518,000)*	15·1	11·0	0·86	1·45	1·2	1·8	67/37	28	5·1
Blackburn .. (125,300)*	12·7	12·8	0·98	1·48	2·5	2·2	83/47	39	4·4
Preston .. (126,100)*	15·7	12·2	0·99	1·50	1·6	2·3	73/43	22	6·6

Registered stillbirths per 100 live births: Sheffield, 5·1; Blackburn, 6·8; Preston, 5·7.

* Registrar-General's estimate for 1929. The provisional Census (1931) figures are: Sheffield, 511,742; Blackburn, 122 695; Preston, 118,839.

Sheffield.

Dr. John Rennie is fortunate in the year for his first annual report. The general death-rate was the lowest ever recorded for the city. There was a very low mortality from epidemic disease and the death-rates from tuberculosis, pneumonia, and bronchitis, and the infant mortality-rate were also the lowest on record. The population was over-estimated to the extent of about 6000, but this does not appreciably affect the statistics. Thus the general death-rate of 11·0 will only become after correction 11·1. Sheffield also had a fairly good position among the 18 towns with populations exceeding 200,000. Thus it had the lowest rate of all for respiratory tuberculosis, and was only beaten by Croydon for all tuberculosis. Bradford was the only town with a lower birth-rate; there were three lower for general death-rate and seven lower for infant mortality-rate.

Since 1922 it has been customary to draw the attention of the medical attendant to every unnotified death from pneumonia. The cases notified and treated at home are visited by the Queen's nurses. There were 1568 notifications with 378 deaths. The percentage of cases removed for treatment to the City Fever Hospital and City General Hospital was 31·6. The male deaths from respiratory tuberculosis were 217, and the female deaths 138, whilst the deaths from other forms were 45 male and 41 female. At the end of 1930 the cases on the register numbered 6100. In the case of 1272 of these the sputum had been positive at some period. No case, which at any time has thus been found to be infectious, has so far been cancelled. The number of these positive cases notified from Jan. 1st, 1911, to Dec. 31st, 1922, was

CORRESPONDENCE

ALUMINIUM AND HEALTH.

To the Editor of THE LANCET.

SIR,—Your leading article last week (p. 595) will be welcomed by many readers. I entirely agree with the statements made as to the harmlessness and innocuousness of this modern non-ferrous metal on the human frame. From comparative analyses it would appear that aluminium contains fewer impurities of a possibly deleterious nature than any other metal in domestic use. During the past twenty years I have had many hundreds of workers in aluminium in large factories under my care. During this time I have had no evidence whatever of any industrial disease (such as is to be found in some other metal industries) resulting from the ingredients which are used in the manufacture of aluminium ingots.

The pure bauxite clay and cryolite used in the manufacture of the metal are of the highest purity. The former is carefully calcined and much of the fine alumina dust and hot furnace fumes must be inhaled or swallowed by the workers in the factories. Yet I have never observed the slightest signs of ill-health, temporary or chronic, which could be attributed to the inhalation of alumina. Numerous workers who have spent the greater part of their working lives, some for thirty years, are in excellent health, and show no sign of nervous depression. The health of their dependants resident in the immediate vicinity is exceptionally good. Large families are the rule. For example, one busy aluminium industrial centre has a population of 1400, including 470 thriving children.

In my own household aluminium cooking and infusing utensils are appreciated on account of their lightness, cleanliness, and easy transmission of heat. If cleaning is done by wire abrasion with a trace of soap the same articles can be kept smooth, clean, bright, and spotless for years. With a cooking surface kept perfectly smooth and free from cracks, there is much less chance of particles of organic matter being left to decompose in the pans. Another helpful point in the use of aluminium vessels is that, when bringing certain foods to the boil, they are hardly ever singed.

Alumina in the shape of pure clay has of course been given in considerable quantities in certain diseases without poisonous results. As you say, aluminium appears to be mostly eliminated by the intestinal route, and does not enter the vascular channels.—I am, Sir, yours faithfully,

LACHLAN GRANT.

Bacteriological Laboratory, Ballachulish, Argyllshire,
Sept. 14th, 1931.

DUCK EGG POISONING.

To the Editor of THE LANCET.

SIR,—A case was recently recorded in the press of a man who had died as a result of eating cake made with duck eggs. The man's wife who had also partaken of the cake became seriously ill but recovered. W. M. Scott[1] describes the occurrence of a case of acute gastro-enteritis due to salmonella. In his case the patient ate a portion of cream which had been prepared for a trifle by whipping the white of duck eggs. It has been established that bacterial infection of the egg albumin does occasionally occur, and the infecting organism is often *B. aertrycke* in duck eggs laid in and around infected ponds. The most likely mode of infection according to A. Lecoq who wrote a monograph on the subject published in Paris in 1906 is that the infected material is introduced into the oviduct of the hen or duck during copulation. The infection has been found to occur in the albumin as it is deposited around the yolk. He actually found small seeds, stones, and pieces of sticks embedded in eggs and introduced in this manner. Spencer Low thought that infection of the ovary, oviduct, and egg with salmonella could take place as part of a generalised infection of the blood. It has been found that if eggs are kept dipped in cultures of *B. aertrycke* they may become infected in a few days. As the eggs become staler, the salmonella multiply rapidly, and a portion of a stale egg would represent a truly enormous dose of the infection. Curiously enough such an egg may appear to the sense of smell as no more than slightly stale and not unsuitable for making custards or cream. When the eggs are not thoroughly cooked, or where they are merely whipped, as for a cream or a custard or an ice-cream, the danger is apparent.

In a case under my own observation the preliminary symptoms resembled an attack of migraine. There was some visual disturbance followed by the familiar hemicrania localised to the left frontal region. The hemicrania gave place to a sensation of pins and needles on one side of the body; great muscular weakness supervened, and the patient was quite unable to walk unaided. He had some facial paralysis, and a complete disorientation as to place and time. The patient became apprehensive with a fear of impending death, and he had a rigor. It is difficult to understand why in a meal consumed by many people, the patient was the only sufferer. It may be that the portion of cream allotted to the patient alone contained the specific poison. After he had been put to bed with hot bottles he had violent pains in the head, alternating with bouts of vomiting, for some time. The toxic substance was doubtless eliminated through the vomiting and this natural process suggests that the best treatment of such cases is probably gastric lavage.—I am, Sir, yours faithfully,

London, Sept. 14th, 1931. C. HORWITZ.

MECHANISM OF PULMONARY COLLAPSE.

To the Editor of THE LANCET.

SIR,—I am extremely interested in Sir Charlton Briscoe's theory of the mechanism of massive collapse of the lung. Since, however, neither marked cyanosis nor gross mediastinal shift are normally associated with either simple pulmonary deflation or simple pleurisy, it would be helpful in considering this theory to know how he would explain these concomitants of the condition.

I am, Sir, yours faithfully,

C. O. S. BLYTH BROOKE,
Chief Tuberculosis Medical Officer,
Antrim County Council.

Belfast, Sept. 13th, 1931.

To the Editor of THE LANCET.

SIR,—I yield to no one in my admiration for the enthusiasm of, and the work done by, Sir Charlton Briscoe in relation to the mechanism of lung inflation. I find it difficult, however, to follow his new theory

Continued at foot of next page.)

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[1] Brit. Med. Jour., 1930, ii., 56.

PARLIAMENTARY INTELLIGENCE

NOTES ON CURRENT TOPICS.

THE FINANCIAL CRISIS.

REASSEMBLY OF PARLIAMENT.

BOTH Houses of Parliament reassembled on Tuesday, Sept. 8th, for a special session to deal with the economic and financial crisis which has arisen since the adjournment for the summer recess on July 31st. The Prime Minister (Mr. Ramsay MacDonald), in the House of Commons, and Lord Reading (Secretary of State for Foreign Affairs), in the House of Lords, explained the reasons for the resignation of the Labour Government and the setting up of a national administration to balance the Budget and to restore confidence in British credit at home and abroad. The new Government was opposed in the Commons by the greater part of the Labour Party, under the new leadership of Mr. Arthur Henderson, but some Labour members decided to defy the General Council of the Trades Union Congress and to support the Prime Minister, Mr. Snowden, and Mr. J. H. Thomas in the line they have taken in joining the new Government and insisting upon a drastic policy of cuts in national expenditure, including certain social and other national services, and relief payments to unemployed persons. After a long debate a division which was taken on Tuesday night in the House of Commons resulted in a vote of confidence for the National Government by 309 votes to 249, a majority of 60.

THE SUPPLEMENTARY BUDGET.

On Thursday, Sept. 10th, the House of Commons went into Committee of Ways and Means, Sir DENNIS HERBERT, chairman of committee, in the chair.

Mr. SNOWDEN (Chancellor of the Exchequer) made his Supplementary Budget statement. He said that he was discharging one of the most disagreeable tasks that had ever fallen to his lot. It was no pleasure to call upon people to make sacrifices or to bear additional burdens, and only a consciousness that those sacrifices and burdens were necessary to avert far greater sacrifices and burdens made his task that day tolerable. It was undoubtedly a fact that nationally we had for some time past been living beyond our means, and living to a considerable extent upon our capital. The trade depression of the past ten years had reduced the yield of taxes, and at the same time had increased expenditure. Seven years ago the Unemployment Fund was paying its way. It was paying off debt. This year it was costing the Exchequer about £100,000,000. He could only meet the present situation by reducing expenditure or by increasing taxation, or by a combination of both. The nation had been under the delusion during the last few years that in these times of unparalleled depression it could maintain the expenditure of more prosperous times. Our total national and local taxation was now very near one-third of the total national income. The Government had decided that borrowing for the Unemployment Fund and the Road Fund must cease, and this decision must apply to the current financial year. There would be a loss of revenue this year from taxes of £29,000,000; from reparations under the Hoover Plan there would be a loss of revenue of £30,300,000, or a total of £59,300,000. There would have to be supplementary estimates of £813,000, and the cessation of borrowing for unemployment and the Road Fund would account for £34.000.000, or a total of just over £94,000,000. They were saving about £13,500,000 in interest on the American debt, and £5,750,000 on the Sinking Fund on that debt. These two figures amounted to £19,300,000. which, deducted from £94,000,000, gave an estimated deficit on this year's Budget of £74,700,000. It was estimated that the deficit on next year's Budget would rise to the appalling figure of £170,000.000.

Nine-tenths of the economies which the present Government proposed to make in national expenditure were approved by the late Government. The saving which these economies would effect on this year's Budget was estimated at £22,000,000 towards the £74,000,000. The charge against revenue for debt redemption was to be reduced by £13,700,000 this year and by £20.000,000 next year. To balance the Budget he would require to impose additional taxation to yield £30,000,000 for the current year, and £80,000,000 for next year. He proposed to raise the standard rate of income-tax by 6*d*., making it 5*s*. in the pound. Concurrently he proposed to revise the various personal and other allowances which determined the scope and graduation of the tax. Personal allowances to single persons would be reduced from £135 to £100, and to married persons from £225 to £150. The children's allowance would be reduced from £60 to £50 for the first child, and from £50 to £40 for each subsequent child. Housekeeper allowance would be reduced to £50. Deduction of tax under Section 40 (2) of the Finance Act, 1927, as amended by Section 10 of the Finance Act, 1930, would be altered to a deduction of tax at half the standard rate on an amount of income not exceeding £175. Sur-tax payable under Section 6 of the Finance Act, 1931, would be increased by 10 per cent. The tax on beer would be raised 1*d*. per pint, and on tobacco 8*d*. per lb. The petrol tax would be raised by 2*d*. per gallon. As from Nov. 9th, the entertainment tax would be raised to 1*d*. in every 6*d*., and extended down to sixpenny admission. The Finance Bill, Mr. Snowden said, would include clauses to facilitate the conversion of the 5 per cent. War Loan to a lower rate of interest. Such conversion would be proceeded with at the first suitable moment.

On resuming his seat Mr. Snowden was loudly cheered by Ministerial supporters. Members, including Mr. Snowden's colleagues in the new Government, rose from their seats and joined in the demonstration. The Opposition remained seated, and hurled taunts and jeers across the floor at Mr. Snowden.

Mr. GRAHAM, who was the President of the Board of Trade in the late Government, was the chief speaker for the Opposition. He said that he thought that there were abundant reasons under existing conditions for abrogating altogether the Sinking Fund for the time being. Even in these difficult times he believed the Budget could be balanced without an attack upon the rates of unemployment benefit, or upon education. The Opposition would fight on that issue in the detailed discussion in Committee. He recognised that vast new burdens were being imposed

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(*Continued from opposite page.*)

of the causation of lung collapse for the following practical reasons:

(1) In the case of the average (eight out of ten) female patient, the excursion of the diaphragm in the erect posture is very slight, so limited, indeed, as to make the young radiologist describe the act of inspiration as "mainly thoracic." In the supine posture the same woman will use the diaphragm freely.

(2) After phrenic avulsion there is no lessening in the transillumination of the base of the involved lung.

I look to Sir Charlton to clear up these difficulties, as he has already solved many for myself. For the present I think the theory of temporary blocking of a bronchus, with which we are all familiar, must take pride of place.

I am, Sir, yours faithfully,

STANLEY MELVILLE.

London, W., Sept. 14th, 1931.

upon the community, but the principle of equality of sacrifice which the Prime Minister had laid down was not being carried out.

The debate on the Budget resolutions was adjourned.

THE ECONOMY BILL.

On Friday, Sept. 11th, the Prime Minister moved the second reading of the Economy Bill in the House of Commons. He said that if the economy measures which had to be enforced immediately were to be discussed at length in Parliament their efficacy would be lost. The Government would fail in their duty if they did not act swiftly and stop the cracks through which the nation's resources had been flowing unnecessarily. This Bill, therefore, laid down procedure which was as drastic as the proposals it contained. It was proposed that certain action should be taken by Orders in Council which could be issued by the Government up to one month after the passing of the Bill. The Orders in Council were limited in their operation. In regard to the Ministry of Health there would be proposed a certain re-adjustment of funds, not to diminish the efficiency of the services, but to deal with certain other funds that were going in directions which, in the opinion of the Government, were not very profitable from the point of view of health insurance. Powers would be taken by Orders in Council to transfer those funds. The only fund that appeared to be affected was the Pensions Fund. This Fund had to be revised in 1924, and the effect of the Government's proposal that certain employers' contributions should be transferred from that fund to certain general expenses of the National Health Insurance would mean that the re-examination would be made two years earlier. That was the only substantial change that was proposed in the working of that economy. The Bill would enable increased contributions to be made to the Unemployment Fund, and certain contracts to be readjusted and revised. The Government's scheme worked out as follows: £70,000,000 was to be found by economies, and £80,000,000 by taxation.

OPPOSITION AMENDMENT.

Mr. CLYNES, who was Home Secretary in the late Government, was the chief speaker for the Opposition. He moved:—

> "This House, whilst recognising the necessity for preserving the country's finances on a sound basis, cannot accept proposals which will deprive masses of the people of necessities of life whilst others remain in the enjoyment of luxuries, and will aggravate unemployment by restricting the purchasing power of wage-earners; nor can this House approve the second reading of a Bill abrogating Parliamentary control by authorising the making of Orders in Council designed to supersede existing Acts of Parliament or reverse settled national policy without the previous specific assent of the House of Commons."

He said that in regard to the cuts in the health services the view of the Opposition was that a lower standard of efficiency could not be for the industrial or social well-being of the country. A contract between the Government and monied interests was sacred, but in the lightest and most airy way the Prime Minister would vary or break a contract between the State and its citizens; men in various public services had secured conditions of remuneration and service which were now to be varied by Orders in Council. Many of these men had helped to save the country during the war. They would now be subject to the secret decisions of the smallest Cabinet of modern times. They could not have real economy by reducing the buying power of the people, and very shortly these substantial reductions would be reflected in ever-increasing unemployment, as well as in deepening distress among the more needy section of the public.

After further discussion the debate on the second reading of the Bill was adjourned.

SUMMARY OF PROPOSALS.

The Government's economy proposals include cuts in expenditure on education amounting to £10,300,000; on university grants to £150,000; and on health services to £1,250,000—or £11,700,000 out of the total economies of £70,000,000. The cuts in health services include a reduction in the remuneration of national health insurance doctors of one-ninth on the present rate of 9*s.* per year for each insured person. This reduction will take place from Oct. 1st, 1931. A similar percentage reduction is to be made from the same date from the remuneration paid to national health insurance chemists.

ADJOURNED DEBATE.

On Monday, Sept. 14th, the debate on the second reading of the Economy Bill was resumed in the House of Commons.

Mr. ARTHUR GREENWOOD (who was Minister of Health in the late Government) supported the amendment moved by Mr. Clynes on Friday, Sept. 11th. He said that the real difference between the late Government and the present Government was that the former were prepared to consider all possible proposals, however drastic, if they would achieve true equality of sacrifice. The present Government seemed to have swallowed the May Report holus-bolus, including the cuts in the rate of unemployment benefit, and had not given the country that equality of sacrifice of which some hon. Members were so fond of talking. That really was the breaking-point. He thought that the House ought to know before this Bill was given a second reading what the proposed slowing down would mean. In regard to the cut in education expenditure, was there, for example, to be a restriction of the school medical service? Was it intended to slow down the building of working-class houses, and did the Government intend to adopt that part of the May Report which suggested a reduction in the housing subsidy next April? Further, was the prolongation of the Insurance Act to go by the board before the end of the year? Was the rapidly developing maternity service, which had shown some considerable growth during the past 12 months, to come within the slowing-down process? This Bill might be the price which had to be paid to those who controlled society to-day. Noble efforts were made by hon. gentlemen opposite to do their best in the circumstances, but it appeared inevitable that in those circumstances this Bill was the price that the country had to pay to be rescued from the difficulties of the immediate crisis. But a sense of injustice was growing in the country as a consequence of this being the one method by which they must deal with the situation. While there might have been an immediate victory for existing economic and financial forces, he believed that this Bill, and the subsequent actions of the present Government, would strengthen a movement which would gain enormously in new adherents.

Sir HERBERT SAMUEL (Home Secretary) said that those who represented the Liberal party and Liberal principles and ideals felt a profound regret that their policy of national development, on which their hearts were set, was necessarily subjected to some check. But they were under the hard compulsion of financial and economic necessity, owing to the lack of resources in the nation as a whole, to carry through the measures which were found to be necessary under the circumstances. Of that necessity they were absolutely convinced. It was for that reason that many of them, who for 40 years had taken an active part in the work of social reform, now found themselves compelled, by the action of their own hands, to injure the very causes in which they passionately believed. Just as an army knew that it needed generalship, so democracy knew full well that it needed leadership, and he did not think that anything in recent weeks had met with more complete and popular approval than the formation of a small Cabinet and the swiftness of its action. Nothing would be more profoundly disapproved than the spectacle of Parliament engaging in weeks and months of debate while the financial and economic position of the nation deteriorated week by week and month by month. All successful democracies had been ready in a time of emergency to curtail their own liberties, and even the powers of their representative assemblies. Sir H. Samuel proceeded to give an account, from notes which he had made at the time, of the conferences between the Liberal and Conservative leaders and a subcommittee of the late Government during the crisis in August. He gave details of the figures which were communicated to the party leaders as to the economies which the late Cabinet would be prepared to carry out, and stated that, except in the section relating to unemployment, the items in the White Paper produced by the present Government were, with very small differences, item for item exactly the items that were communicated to them on behalf of the late Government as those regarded by the late Cabinet as proper economies if economies had to be made along those lines. The conclusion which the House must draw was that if the right hon. gentlemen, who now formed part of the Opposition, had remained in office and had had the responsibility for dealing with the situation, and if all their complete proposals had been accepted with regard to unemployment benefit, direct taxation, and so forth, this was the very list of economies which they would have proposed.

After further discussion,

Mr. CHAMBERLAIN (Minister of Health), in winding up the debate on behalf of the Government, said that the amendment asked the House to reject the Bill on two grounds. First, on the ground of the alleged unfairness of its provisions, and, secondly, on the ground of the method of its procedure. The procedure adopted in this Bill was not without precedent. In the opening days of the Great War an Act was passed authorising the making of Orders in Council for public safety and the defence of the realm; this Bill had precisely the same purpose. In spite of the doubts of some members of the Opposition, it could not be seriously contested that a crisis did exist, and a very serious crisis. They found themselves in this position: that to-day instead of the Government being in the dock it was the members of the Labour Party. What had been clearly established was this, first, that the late Government accepted economies amounting to £56,000,000, and, secondly, that those £56,000,000 included every single one of the proposals which were before the House that day, except the 10 per cent. cut in unemployment benefit. What, then, was the use of the Opposition pretending that they did not know what was included in the cut which was to take place? Everyone admitted that these proposals must have an immediate effect on increasing unemployment, but to complete the programme they needed a constructive programme to stimulate the progress of industry and agriculture. The country could not long await that constructive programme. The sooner that Parliament concluded this business the sooner the Government or its successors would be able to begin on the work of building up.

SECOND READING CARRIED.

The Bill was read a second time by 310 to 253—Government majority 57.

HOUSE OF COMMONS.

MONDAY, SEPT. 14TH.

Stamp Duty on Patent Medicines.

Mr. MILLS asked the Chancellor of the Exchequer if he was aware that thermogene, antiphlogistine, and many other patent medicines were now being sent to qualified chemists without revenue stamps of 3*d.* and 6*d.* attached; and whether, as chemists were suffering from this recent policy, he would consider what steps should be taken to protect the revenue.—Mr. SNOWDEN replied: The law provides for exemption from medicine stamp duty in favour of "known, admitted, and approved" remedies when sold under certain conditions by duly qualified chemists or druggists. I am aware that certain manufacturers have taken steps to bring their preparations within the scope of that exemption, but this is not a matter in which I can interfere.

Narcotics Convention.

Lieut.-Colonel FREMANTLE asked the Under Secretary for Foreign Affairs whether British ratification of the 1931 Narcotics Limitation Convention had yet been decided upon; and, if not, when was a decision regarding ratification likely to be made.—Captain EDEN replied: I am informed that legislation amending the Dangerous Drugs Acts in certain respects will be necessary before the Convention for the Limitation of the Manufacture of Narcotic Drugs can be ratified. The matter is under consideration.

Headlights on Motor-cars.

Mr. DAY asked the Minister of Transport when he proposed to make regulations for the purpose of regulating the use of powerful headlights on motor vehicles.—Mr. PYBUS replied: My predecessor circulated draft regulations on this subject to motoring organisations, and to other organisations interested, and also to the press. The comments received in consequence are at present under consideration in my department. I am not yet in a position to make any statement as to the final form of the regulations.

Panel Practitioners' Remuneration.

Mr. RHYS DAVIES asked the Minister of Health if he would show in tabular form, annually in each case, the number of medical practitioners acting as panel doctors under the National Health Insurance scheme since it came into operation; the total amount paid to such panel doctors; the number of doctors receiving payment in this connexion; the number of insured persons; and the capita grant per insured person paid.—Mr. CHAMBERLAIN replied: The figures are as follows:—

Year.	Insurance doctors.	Total payments to insurance doctors.	Number of insured persons.	Capitation fee.
		£		
1913	12,674	3,858,000	11,521,772	7*s.* 6*d.* (on average).
1914	12,868	3,673,000	12,425,421	
1915	12,675	3,470,000	10,116,920	
1916	12,321	3,353,000	10,333,003	
1917	11,984	3,845,000	10,622,562	
1918	11,675	3,611,000	10,679,901	
1919	11,346	4,052,000	11,454,616	
1920	11,620	7,403,000	12,931,763	11*s.* 0*d.*
1921	12,216	7,821,000	13,225,000	
1922	12,531	6,773,000	13,275,000	9*s.* 6*d.*
1923	12,862	6,670,000	13,295,000	
1924	13,211	6,476,000	13,672,000	9*s.* 0*d.*
1925	13,823	6,518,000	13,695,000	
1926	14,432	6,661,000	14,102,000	
1927	14,952	6,831,000	14,363,000	
1928	15,269	7,037,000	14,814,000	
1929	15,563	7,109,000	14,959,000	
1930	15,750	7,300,000	15,398,000	

TUESDAY, SEPT. 15TH.

Ambulances in Irish Free State.

Mr. ROSS asked the Secretary of State for Dominion Affairs whether he was aware that, by a recent enactment of the Irish Free State, fire-engines and ambulances from Northern Ireland were prevented from going to the assistance of persons obliged to live in that Dominion, even where such assistance could not otherwise be provided; and whether he would make representations to the Government of the Dominion as to this situation.—Mr. MALCOLM MACDONALD (Under Secretary of State for Dominion Affairs) replied: The matter in question is entirely one for His Majesty's Government in the Irish Free State. I understand that no restrictions are imposed upon fire-engines and ambulances entering the Irish Free State from Northern Ireland when need arises.

BETHLEM HOSPITAL: ANNUAL REPORT.—The annual statement of accounts shows that the ordinary income for the year exceeded expenditure by nearly £3000. The cost of furniture, &c., for the new hospital at Monks Orchard has been charged to extraordinary expenditure, with the result that there was a debit balance of more than £9000. The accommodation is for 250 patients, and at present 160 have been admitted. Progress has been made in the science and treatment laboratories. Dr. Alastair McGregor has been appointed director of physiotherapy and Dr. William Brown director of the psychological department. The research department, under the direction of Dr. Lovell, the hospital pathologist, is widening its scope, and sister hospitals have been informed of the willingness of the governors to consider applications for affiliation to the hospital for the purpose of research and for the undertaking of analytical work.

MEDICAL NEWS

University of London: Lectures in Pathology.

The following lectures will be given on Tuesdays, at 5.15 P.M., at University College Hospital Medical School, Gower-street, W.C.: Oct. 13th and 20th, Prof. J. C. G. Ledingham, F.R.S., on Resistance to Infection, natural and induced. Oct. 27th and Nov. 3rd, Prof. C. R. Harington, F.R.S., on the Chemistry and Functions of the Thyroid Gland. Nov. 10th and 17th, Miss Harriette Chick, D.Sc., on Vitamins and Disease. Nov. 24th, Dec. 1st and 8th, Dr. R. T. Grant, on the Pathology of Endocarditis. Admission is free to medical students and graduates.

University College Hospital Medical School.

The annual post-graduate demonstrations arranged for the benefit of old students will take place on Oct. 15th and 16th. Among the subjects dealt with will be: Diet in Gastric Ulcer, Perineal Tears, Chronic Chest Ailments in Young Children. Recent Changes in the Treatment of Diabetes, Skiagenic Tuberculosis of the Lungs, and Acute Arsenical Poisoning.

The annual dinner of old students will be held at the Hotel Victoria, London, W.C., at 7.30 P.M. on Oct. 16th, and the annual dinner of past and present women students of University College Hospital will be held at the same time at the Piccadilly Hotel.

St. George's Hospital Medical School.

Lord Ponsonby will present the prizes and deliver the inaugural address at 3 P.M. on Oct. 1st in the Board Room of St. George's Hospital. The annual dinner of the Medical School will take place at the Hyde Park Hotel, Knightsbridge, London, S.W., at 7.45 P.M. on the same day.

As a result of the annual examination, the following *Entrance Scholarships and Exhibitions* have been awarded: J. A. Lewis, the William Brown Senior Exhibition of £120; Morvyn Williams, the William Brown Junior Exhibition of £80; F. R. Berridge and R. D. Holloway, an Anne Selina Fernee Scholarship of £80 each; A. N. F. Critchley and R. A. Binning, an Anne Selina Fernee Exhibition of £60 each; C. E. Elliott, the Devitt-Pendlebury Scholarship of £50, and S. Ginsburg, an Entrance Exhibition of £40.

King's College Hospital Medical School.

The opening of the winter session will take place at the Medical School, Denmark-hill, S.E., on Oct. 1st, at 2.15 P.M. The introductory address will be given by Prof. H. R. Dean, Professor of Pathology in the University of Cambridge. Mr. A. D. Power, vice-chairman of the committee of management of King's College Hospital, will preside. The annual dinner of past and present students will be held the same evening at 7.30 P.M. at the Connaught Rooms, Mr. L. Vernon Cargill presiding.

A series of post-graduate lectures, free to all medical practitioners, will be delivered in the lecture theatre of the Medical School on Thursdays at 9 P.M. from Oct. 8th to Dec. 17th inclusive, and from Jan. 7th to March 17th. The opening lecture will be delivered by Sir StClair Thomson on Cancer of the Larynx. Subsequent lectures will be announced weekly in our Medical Diary.

St. Mary's Hospital Post-graduate Course.

The annual week-end post-graduate course, open to all medical practitioners without fee, will be held from Oct. 2nd to Oct. 4th inclusive in the library of the Medical School. The subjects to be discussed include the treatment of common fractures, rheumatoid arthritis, chronic cough, chronic indigestion, colitis, and slow labour. Other lecturers will deal with diseases of the tongue, prenatal care, surgical operations in old people, toxæmias of pregnancy, common disabilities of the foot, new methods of genito-urinary surgery, fever without signs, the treatment of chronic cough.

National Council for Mental Hygiene.

A series of lecture-discussions will be delivered in the lecture room of the Medical Society of London, 11, Chandos-street, Cavendish-square, W., on Thursdays, at 5.15 P.M., on Oct. 22nd, 29th, Nov. 12th, 19th, 26th, and Dec. 10th. The subjects will be the Prevention and Treatment of Nervous Breakdown, Sex Education, Crime and Punishment, the Mind of a Child, Marriage and Parenthood, and Psycho-analysis. The lectures will be delivered respectively by Dr. A. Helen Boyle, Dr. Israel Feldman, Dr. Letitia Fairfield, Dr. William Moodie, Dr. Doris M. Odlum, and Dr. Ernest Jones. Further particulars can be obtained from the secretary of the council at 78, Chandos House, Palmer-street, London, S.W. 1.

Surgical Instrument Manufacturers' Association.

The annual dinner of this association will take plac the Holborn Restaurant, London, on Friday, Oct. when Mr. T. P. Dunhill, assistant surgeon to St. Ba lomew's Hospital, and Mr. A. R. Melhuish, President of the Pharmaceutical Society, will be present as guests.

Public Health and the Gas Industry.

A discussion on this subject will be held at 10.15 A.M. on Sept. 29th at the Rougemont Hotel, Exeter, in conne with the conference of the British Commercial Gas Asso tion. The discussion will be opened by Dr. Meredith Dav and will be followed by one on gas as a source of radi energy for treatment of disease, to be opened by Sir Leon Hill, F.R.S.

North Middlesex County Hospital, Edmonton.

The new radiological pavilion will be opened by Mr. George Marlow Reed, chairman of the Middlesex County Council, at 3 P.M. on Sept. 29th, and the nurses' home extension will be opened by Mrs. Marlow Reed at 3.30 P.M.

Reopening of Tenbury Hospital.

This hospital, which was closed two years ago owing to lack of support, has now been reopened. It is to be run in conjunction with the District Nursing Association.

Westbury Cottage Hospital.

This Wiltshire hospital has been rebuilt at a cost of £11,000, and the Duchess of Beaufort formally opened it last week. The cost per bed, including furnishing and equipment, was £550.

Nelson Hospital, Merton.

An extension of this hospital at Merton, Surrey, has recently been opened. It includes maternity and antenatal departments, with accommodation for 21 patients, who will pay according to their means. The extensions, reconstructions, and equipment have cost £45,000.

Maternity Home at Craigmonie.

Lady Bertha Dawkins recently opened new buildings at the Ida Merry Maternity Home at Craigmonie, Inverness, which contains ten beds, with nursery and isolation wards. The original home was established some years ago by the Hon. Mrs. Merry, of Belladrum.

A Debt-free Hospital.

Countess Fitzwilliam recently opened a new out-patients' department at Rotherham Hospital which has cost £22,500. The whole of the money has been provided, and the hospital itself is out of debt. The new building includes departments for massage, casualties, sunlight, dentistry, ear, nose, and throat treatment.

Northampton Isolation Hospital.

At a cost of about £5000 much enlarged provision has been made for the service of this hospital at Kingsthorpe. Many bedrooms and other accommodation for the staff have been provided, and the additions were opened last week by the Mayor of Northampton, Councillor E. Ingman.

York County Hospital.

It has been decided to establish a contributory scheme for the York County Hospital, which has an overdraft of about £18,000. Between Jan. 1st and August 1st the hospital admitted 104 accident cases, the treatment of which cost over £1000, towards which only £179 was received; of this one patient paid £88.

Davos Tuberculosis Meeting.

A meeting organised by the Davos Medical Society will be held from Oct. 5th to 10th, the subjects for discussion being (1) Development and Course of Pulmonary Tuberculosis; (2) Extra-pulmonary Tuberculosis; (3) Collapse Therapy. Lectures will be given at the Palace Hotel, Davos-Platz, in four languages, by specialists from many parts of Europe. Delegates from this country include Dr. H. Batty Shaw, Sir Henry Gauvain, Dr. L. S. T. Burrell, Dr. F. G. Chandler, and Mr. H. Morriston Davies. Prof. L. Brauer, of Hamburg, will give a public lecture on the significance of research institutes for tuberculosis. Accommodation at reduced terms will be available in nine hotels, and Messrs. Thomas Cook and Son are making the travelling arrangements. Further information from the President of the Medical Society, Davos-Platz, Switzerland, to whom names should be sent before Oct. 1st.

Medical Diary

nformation to be included in this column should reach us proper form on Tuesday, and cannot appear if it reaches later than the first post on Wednesday morning.

LECTURES, ADDRESSES, DEMONSTRATIONS, &c.

LOWSHIP OF MEDICINE AND POST-GRADUATE EDICAL ASSOCIATION, 1, Wimpole-street, W.

MONDAY, Sept. 21st, to SATURDAY, Sept. 26th.—INFANTS HOSPITAL, Vincent-square, S.W. Second week of post-graduate course in Diseases of Infants. Every afternoon at 2 P.M. WESTMINSTER HOSPITAL, S.W.—Second week of course in Medicine, Surgery, and the Specialties. Men only. Daily, 10.30 to 5.30. Further particulars from the Fellowship of Medicine.

CENTRAL LONDON THROAT, NOSE, AND EAR HOSPITAL, Gray's Inn-road, London, W.C.

FRIDAY, Sept. 25th.—4 P.M., Mr. W. A. Mill: Ear-ache in the Normal Ear.

MARK'S HOSPITAL, City-road, E.C.

THURSDAY, Sept. 24th.—4.30 P.M., Mr. L. E. C. Norbury: Benign Strictures of the Rectum.

Appointments

Certifying Surgeons under the Factories and Workshops Acts: CAMPBELL, E. G., M.B., Ch.B. Dub. (Ripley, W. Riding); DAVIDSON, J., M.B., Ch.B. Sheffield (Hillsborough, W. Riding); PETCH, H. C., M.B., Ch.B., Leeds (Pateley Bridge, W. Riding); SADLER, C. G. A., M.R.C.S. Eng., L.R.C.P. Lond. (Teddington, Middlesex); MCGIBBON, J. H. (Higham Ferrers, Northampton), and WILSON, W. M. (Littleport, Cambridge).

Vacancies

For further information refer to the Advertisement columns.

Aberdeen Royal Infirmary.—Jun. Asst. Surgeon.

Aberdeen Royal Mental Hospital.—Second Asst. Phys. £100.

Altrincham General Hospital.—Jun. H.S. At rate of £120.

[illegible]bury, Horton General Hospital.—Res. M.O. At rate of £150.

Birmingham City Education Committee.—Two Asst. School M.O.'s. Each £500.

Birmingham General Hospital.—Med. Reg. and Res. M.O. £155.

Birmingham, [illegible] Dept.—Asst. M.O. for Tuberculosis Section. £400.

Birmingham, St. Chad's Hospital.—Res. M.O. £100.

Birmingham, Selly Oak Hospital.—Cas. O. At rate of £200.

Blackburn County Borough.—Asst. School M.O. and Asst. M.O.H. £700.

Bradford City Sanatorium, Grassington.—H.P. £225.

Burnley County Borough.—Asst. M.O.H. and Asst. School M.O. £500.

Cardiff, King Edward VII. Welsh National Memorial Assn.—Two Area Tuberculosis Physicians. Each £750.

Cardiff Royal Infirmary.—Two H.S.'s to Special Departments. Also H.P. and H.S. All at rate of £50.

Central London Throat, Nose, and Ear Hospital, Gray's Inn-road, W.C.—Assts. for Out-patient Dept.

Cheadle, Cheshire, Barnes Convalescent Hospital.—Res. M.O. £250.

Chester, Royal Infirmary.—H.S. £150.

Chester, Wrenbury Hall Tuberculosis Training Colony.—H.P. £250.

City of London Hospital for Diseases of Heart and Lungs, Victoria Park, E.—H.P. At rate of £100.

Eastern Dispensary, Leman-street, E.—Ophth. Surg.

Exeter, Royal Devon and Exeter Hospital.—Cas. O. and H.S. to Special Depts. Each at rate of £150.

Gateshead Dispensary.—Asst. M.O. £300–£350.

Glasgow, Woodilee Mental Hospital, Lenzie.—Jun. Asst. M.O. £300.

Golden-square Throat, Nose, and Ear Hospital, W.—Hon. Surg.

Great Yarmouth General Hospital.—H.S. £140.

Guildford, Royal Surrey County Hospital.—H.S. £150.

Hammersmith Hospital, Ducane-road, W.—Asst. M.O. £350.

Hertford, Ware Park Sanatorium.—Asst. M.O. £300.

Hospital for Sick Children, Great Ormond-street, W.C.—H.S. and H.P. Each at rate of £100. Also Clin. Asst.

Kettering and District General Hospital.—Res. M.O. At rate of £200.

Leicester Royal Infirmary.—Asst. Pathologists. £400. Res. Asst. Anæsthetist. At rate of £250. Also Two Surgical Dressers. 10s. 6d. per week.

Liverpool Eye and Ear Infirmary, Myrtle-street.—H.S. to Ophth. Dept. £120.

Liverpool Heart Hospital.—Hon. Asst. Physician.

Liverpool Royal Southern Hospital.—H.P., M.O. to Spec. Depts., [illegible]s. Anæsthetist. All at rate of £60.

Liverpool, Smithdown-road Hospital.—Res. Asst. M.O. £200.

L.C.C. Mental Hospital Service.—Asst. M.O. £475.

London Female Lock Hospital, Harrow-road, W.—H.S. At rate of £150.

London Homœopathic Hospital, Great Ormond-street, W.C.—Three Res. M.O.'s. All at rate of £100.

Macclesfield General Infirmary.—Second H.S. At rate of £150.

Manchester, Ancoats Hospital.—Res. Surg. O. £200.

Manchester Royal Eye Hospital.—Jun. H.S. £120.

Manchester, Royal Infirmary.—Jun. Asst. M.O. for Radiological Dept. £400.

Margate Royal Sea Bathing Hospital for Surgical Tuberculosis.—H.S. At rate of £200.

Maudsley Hospital, Denmark Hill, S.E.—Deputy Med. Supt. £850.

Metropolitan Hospital, Kingsland-road, E.—Sen. and Jun. H.P.'s and H.S.'s. Also Two H.S.'s. All at rate of £100.

Middlesex County Council, County Tuberculosis Sanatorium, South Mimms.—Asst. Res. M.O. £400.

National Hospital, Queen-square, W.C.—Asst. Registrar. £200.

Norwich, Norfolk and Norwich Hospital.—H.S. for Ear, Nose, and Throat. £120.

Nottingham City Education Committee.—Whole-time Jun. Asst. School M.O. £500.

Nottingham General Dispensary, Broad-street.—Res. Surgeon. £250.

Nottingham General Hospital.—H.P. At rate of £150.

Portsmouth Royal Hospital.—H.P. and Cas. O. At rate of £130 and £100 respectively.

Preston and County of Lancaster Royal Infirmary.—H.S. At rate of £150.

Queen's Hospital for Children, Hackney-road, E.—H.P. At rate of £100.

Queen Mary's Hospital for the East End, E.—Surgical and Dental Anæsthetists. 50 guineas and £25 respectively.

Richmond, Surrey, Royal Hospital.—Hon. Surg. to Ear, Nose, and Throat Dept. Also Jun. H.S. At rate of £100.

Rochdale Infirmary and Dispensary.—Jun. H.S. £200.

Royal London Ophthalmic Hospital, City-road, E.C.—Sen. Res. O. £150.

Royal National Orthopædic Hospital, 234, Gt. Portland-street, W.—Hon. Asst. Surgeon.

Royal Waterloo Hospital for Children and Women, Waterloo-road, S.E.—Cas. O. At rate of £200. Also H.S. At rate of £100.

St. Bartholomew's Hospital, E.C.—Dental H.S. £80.

St. Giles' Hospital, Brunswick-square, Camberwell, S.E.—Part-time Radiologist. At rate of £236 5s.

St. John's Hospital for Diseases of the Skin, 49, Leicester-square, W.C.—Jun. Hon. Med. Reg.

St. Mary's Hospital, W.—2nd Asst. Pathologist. £250. Also Obstetric Registrar. £50.

Salford Royal Hospital.—Res. H.S.'s to Special Depts. Also Cas. H.S. All at rate of £125.

Scarborough Hospital and Dispensary.—Two H.S.'s. Each at rate of £175.

Sheffield, Jessop Hospital for Women.—Sen. Res. M.O. £200. Also Res. M.O. and two Asst. H.S.'s. At rate of £150 and £100 respectively.

Southampton County Borough.—Asst. M.O.H. £500.

South London Hospital for Women, Clapham-road, S.W.—H.P. and two H.S.'s. Each at rate of £100.

Stafford, Staffordshire C.C. County Bacteriological Laboratory.—Asst. Bacteriologist and Pathologist. £700.

Swansea, Infectious Diseases Hospital.—Res. M.O. £350.

Taunton and Somerset Hospital.—Asst. H.S. At rate of £100.

Wells, Somerset, Mental Hospital.—Asst. M.O. £350.

West Riding of Yorkshire County Council.—Temp. Sch. Med. Inspectors. £175.

Wolverhampton Royal Hospital.—H.S. for Orthopædic Dept. At rate of £100.

The Chief Inspector of Factories announces a vacant appointment for a Certifying Factory Surgeon at Alston (Cumberland).

Births, Marriages, and Deaths

BIRTHS.

BINGHAM.—On Sept. 11th, the wife of Thomas H. Bingham, M.D., of Reigate, of a daughter.

DAVIES.—On September 15th, at 1, Pleydell-avenue, W.6, to Dorothy, the wife of G. I. Davies, M.D., D.P.H.(Lond.)—a son.

GUNN.—On Sept. 11th, the wife of Alistair Gunn, M.D., F.R.C.S., of Lawn-road, Hampstead, of a son.

HOCKING.—On Sept. 15th, the wife of Dr. F. D. M. Hocking, of 140, Harley-street, of a daughter.

REID.—On Sept. 8th, at Welbeck-street, W., the wife of Ronald Reid, M.S., F.R.C.S., of a daughter.

SAMUEL.—On Sept. 9th, at Dowlow Asshe, Vallance-road, Muswell Hill, to Dr. E. Summerskill, wife of Dr. E. Jeffrey Samuel—a daughter (Shirley).

WHITE.—On Sept. 9th, at Nailsea, the wife of Dr. R. F. White, of a daughter.

WOOLRICH.—On Sept. 8th, at Sanderstead, Surrey, the wife of Dr. W. Grant Woolrich, of a daughter.

DEATHS.

CROOKE-LAWLESS.—On Sept. 14th, at Folkestone, Surg. Lt.-Col. Sir Warren Roland Crooke-Lawless, aged 68.

JAMES.—On Sept. 9th, at Warwick-road, Upper Clapton, Charles Alfred James, M.R.C.S., L.R.C.P., D.P.H.

N.B.—A fee of 7s. 6d. is charged for the insertion of Notices of Births, Marriages and Deaths.

THE Minister of Health has appointed Captain D. W. Gunston, M.C., M.P., to be his Parliamentary Private Secretary (unpaid).

NOTES, COMMENTS, AND ABSTRACTS

BIOLOGICAL APPROACH TO HEALTH PROBLEMS.

At the annual congress of the Royal Sanitary Association of Scotland, held at Largs, in Fifeshire, Dr. Parlane Kinloch, chief medical officer of the Department of Health, the president, gave an address on the Science of Life. He showed that the administrative health problems of to-day could be safely approached only on a biological basis. He expressed his conviction that the life of members of a modern civilised community must be founded on scientific thinking and living. The health services must draw their sanctions in the last resort from the science of biology. Our gains in biological knowledge in the past 300 years, and, indeed, in the last 30 years, had far exceeded the gains made in the previous 30,000 years. He pleaded for the acceptance of a national biological policy, which would deliberately seek new knowledge and apply it to the end that, as a race, we might grow in health and vigour, resource, and adaptability. In physiology and medicine a reorientation of outlook was needed, so that assessment of fitness and assessment of the degree of incapacity would become of dominant importance. The medical research organisation would push forward the boundaries of biological knowledge, and the central and local authorities would secure the experimental application to the community of the discoveries of medical science. The true basis of administrative measures was a nutritional service. So long as the authorities ignored the achievements of biological research, so long would much of the health services remain a waste of effort. He indicated also the beginning that should be made in mental health service in Scotland by the establishment of four regional psychiatric clinics in the four university cities. At these clinics the early disharmonies leading to mental illness would be defined and controlled, and mental patients sorted out and allocated for appropriate treatment. This would have an immediate effect in reducing the number of certified lunatics as would also a review of certified cases, together with the development of treatment on a voluntary basis. The number of certified lunatics might in this way be reduced by one-third. The address was an inspiring exposition of fundamental principles as applied administratively.

THE DEVELOPMENT OF YOUNG CHILDREN.

Many close observers of the lives of young children have written large and valuable treatises on the thinking and behaviour of the young, but even such classical writers as Wilhelm Stern and J. Piaget, for example, have erred in obtaining much of their information through questions. Mrs. Isaacs records[1] a new and fascinating departure from this method. The data of the lives of the little children in her school are given verbatim in her book. She has taken daily notes of the remarks made and actions performed in what was almost entirely a child world, the grown-ups being largely in the background or joining in only when necessary on the child's level. The result is a curious record of the discovery, reasoning, and thought of children and of their biological interests. Some readers may find this record dull and disconnected, but those who are pursuing child psychology from the educational and from the psycho-pathological point of view will discover much information on the natural pursuits and ideas of the child; many difficulties will be cleared up, and many unacceptable theories more easily understood. In an initial chapter, Mrs. Isaacs shows in what way her methods differ from those of other observers. She promises to make no interpretations while collecting data, nor does she allow herself or her fellow-observers to do more than to describe objectively what the child actually did and said, and the circumstances in which speech and a took place. In this respect she differs from Pi who definitely limits his field of inquiry, and ther the scope of his conclusions, by putting question

Mr. Isaacs has added a considerable chapte children's "Why" questions. This is a cl reasoned classification and analysis of the fau attitude of children towards their environmer their efforts to coördinate their world and to re the disparate elements of perception. This ch is of great value, and in our view the authors' cr attitude to the anthropomorphic views on the cl world put forward by Prof. Piaget is justified.

No workers in the field either of normal (abnormal child psychology can afford to ig a book by Prof. Katharine Bridges on the pre-s child.[2] It is based upon a prolonged study of behaviour of children in contact with one ano and with their elders, and therefore illustrates manner in which the emotional life of the influences, and is influenced by, its social milieu. author starts out with a method which was ded by preliminary experiment with a provisional sch The working out of a social development scale have entailed a great deal of labour. The man observations are at first sight very bewildering, they provide a warning to those who use bro categories that analysis of child behaviour depend upon detailed observations. The therefore of the thesis will depend upon the s of a larger number of cases than are here dealt to make them statistically comparable with number of observations themselves. Workers in same field would be wise if they used the aut scale in order to register their own records. A ch is devoted to the McGill Nursery Scale, and t who are interested in the scientific study of chil rather than in chatty descriptions would do well to this their close attention. The volume is illu by many attractive photographs of children at pl

PRESCRIPTIONS FOR THE DEAF.

In an article on aids to the deaf publishe the *Wireless Magazine* for September, 1931, C. Balbi comments on the fact that while those poor sight seek spectacles, the deaf do not, as a w avail themselves of aids to hearing. In his this is because spectacles are prescribed on scie lines, and the benefits obtained are instantaneous lasting, while aids to the deaf are chosen hapha by the patient himself, and may be found unsui after purchase. Simple magnification does necessarily help the deaf person, since amplif appliances introduce distortion. This distortion he says, be harnessed to supplement the parti range in which the patient's hearing is defec In order to ascertain this range, a standard testing apparatus, known as the audiograph, has devised. When the range is charted, a prescri can be formulated, for example for a bass deaf pe A micro-telephone, with the appropriate character can then be chosen, or an apparatus containi valve amplifier can be used. Such an appa is necessarily more bulky, but it can be adj by means of filter circuits to conform to the spec tion required. Mr. Balbi suggests that while a port micro-telephone will continue to be popular characteristic should be prescribed. He recomm for occasions where portability is not essential, th of an appropriately adjusted amplifier telephone.

After Sept. 21st the address of the offices warehouses of Messrs. Coates and Cooper, (Medical and Pharmaceutical Products), will 94, Clerkenwell-road, London, E.C.1. Telepho Clerkenwell 4100.

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[1] Intellectual Growth in Young Children. By Susan Isaacs, M.A., with an Appendix on Children's "Why" Questions by Nathan Isaacs. London: George Routledge. P[illegible] 6d.

[2] Social and Emotional Development of the Pre-school (By K. M. B. Bridges, Assistant Professor of Psychology, University. London: Kegan Paul. 1931. Pp. 277. 12s